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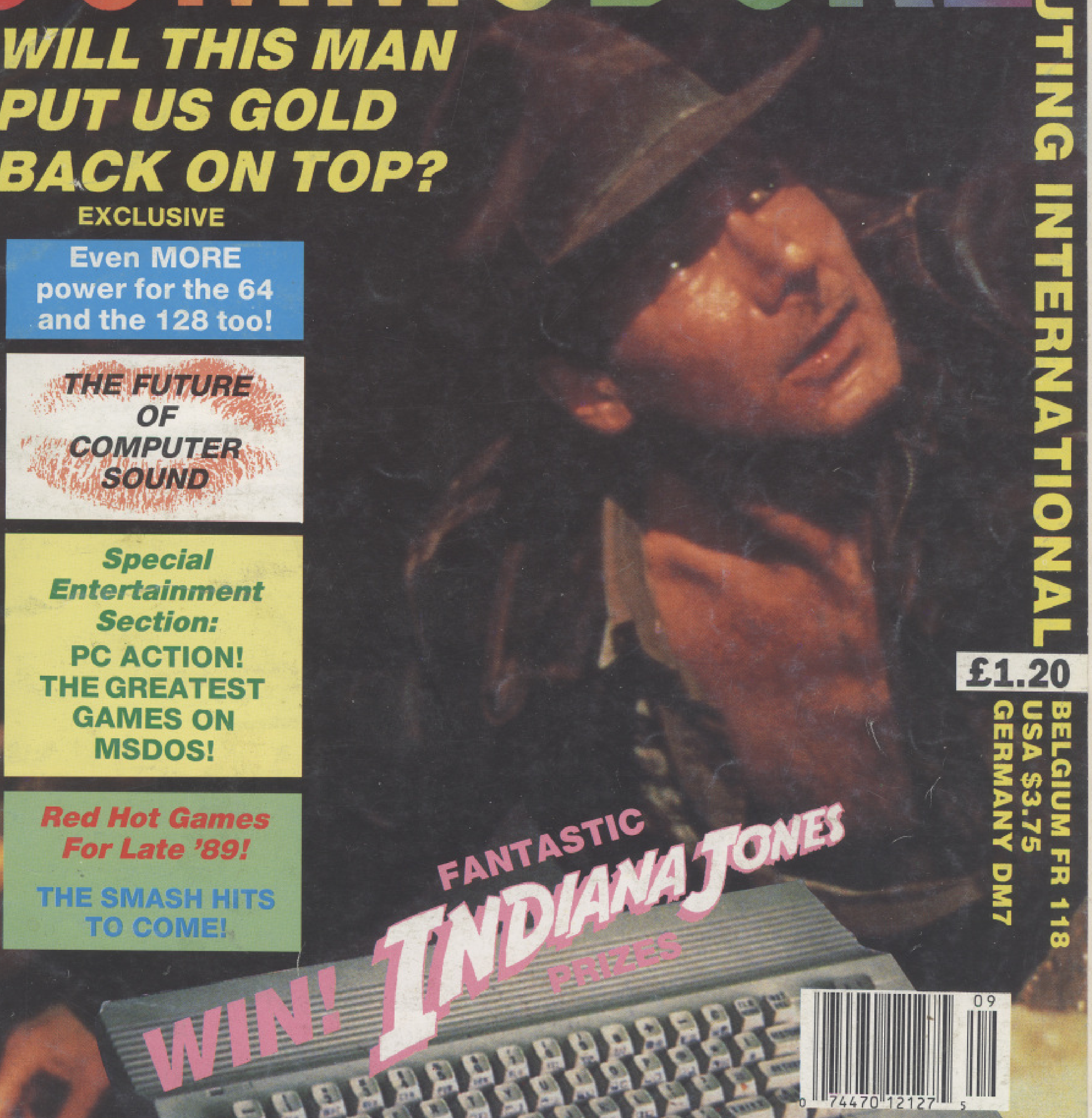

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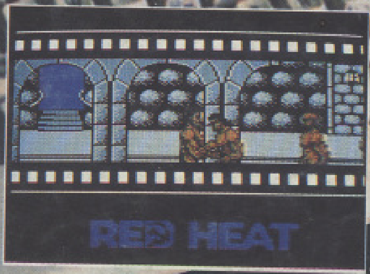

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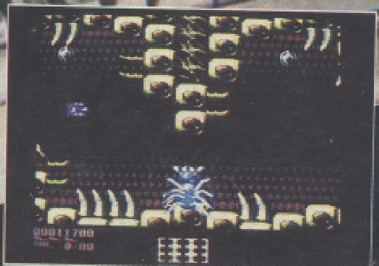

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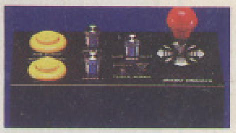

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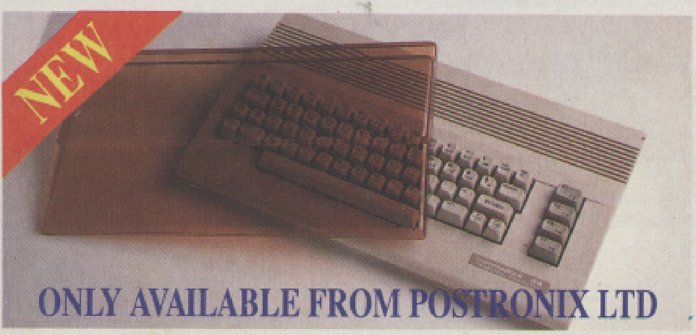

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Inside

COMMODORE COMPUTING INTERNATIONAL

SEPTEMBER 1989 Volume 8 No.1

CCI View 6
Publisher Antony Jacobson ponders the implications of computer development in the UK and abroad.

News 8,9,10,12,14,15
Up to the minute happenings plus the latest whispers of Workbench 1.4.

Home Designer 128 17
It's time to build your castle in the sky, says Bob Collyer.

Vapourware 20
Joe Griffen, vice chairman of ICPUG, looks at the misty history of CBM's hardware.

VizaWrite 64 21
Peter McDonald tours around his favourite Golden Oldie WP program.

The Cloning of Joanna May 24
Daphne Moss reviews Fay Weldon's recent pseudo-science fiction offering.

CCI Subscription Form 25
Essential reading delivered directly to you every month!

The Future of Computer Sound 26
One day all keyboards will be obsolete. Discover the hows and whys with Kati Hamza in this first of a two-part special feature.

A500 Control Centre Offer 28
Protect your Amiga from the harsh elements.

Maverick 29
Andy Eskelson scrutinizes a useful back up utility for the knowledgeable computer user.

Apple's Source For Your Chips 32
Are the rumours of stolen Apple source code just pie in the sky? Mark Smiddy dishes up the facts and gets to the core of this seedy story.

US Gold — The Climb Continues 33
CCI *does its best 'Indy' impersonation and goes in search of the company that helped create the UK software market.*

More 64 Power 38
Peter Gerrard asks: 'Is it time to add peripherals or to move on to another machine?'

Poster Maker 128 42
Don't just print it — make a poster! Bob Collyer reports on a small-sized application with very large implications.

GM Subscription Form 44
Keep on top of the fantasy RPG world.

Care and Feeding of the C256 46
Paul Bosacki tells you how to fatten up your C64.

Compunet 48
Nothing on TV? Spend an evening on-line with Jonathan Littlewood.

Red Hot Games 50
Games expert Tony Horgan previews the greatest scorching games heading your way.

Form Master 53
Is this punting program a sure winner or just a lame offering? Place your bets here ...

Back to Basics 55
Peter Gerrard continues his series on the fine art of Basic programming.

PC Entertainment 60,61,62,63,64,65,66,67,68
More powerful than a spreadsheet, able to leap four column graphs in a single bound, MSDOS games have arrived! CCI presents a power-packed special featuring MSDOS games sure to pull you far, far away from your database.

Horgan's Hints 69
For the POKEr in every player, Horgan has a hint or two.

Adventure 70
The summer has yielded a bumper crop for adventurer Andy Moss.

Red Heat 74
Grab for your gun as you and Arnold face the fire!

Phobia 75
Your worst nightmare may just come true yet!

Silk Work 76
Thundering helio-action on your C64!

Competition 77
WIN! Loads of fantastic prizes can be yours!

Technical Letters 78
Confused? Mystified? Jack Cohen's in depth replies may help.

Bargain Bucket 80
For the low-budget thrill seekers with zap-happy appetites, a sampling of the latest and greatest ...

Chart Chattering Events 84
Look for your favourite (and not-so-favourite) games as they appear, disappear and jump about the charts.

The Write Stuff Offer 85
Are you in search of a powerful WP for your C64? Look no further — it's here!

Programs 87,88,89,90,91,92,93,94

S-ENTRY 95
CCI's exclusive error-free inputting program for C64/128 owners.

Classifieds 96

Magenta Pages 97,98

CCI View

Dear CCI Reader,

A few days ago, a friend asked me if he should buy a C64 or an Amiga for his son and daughter, respectively 6 and 8 years old. Was the Amiga too clever for them? He wanted to know.

Clever? It made me think of a problem I had recently when the Amiga on which I was working refused to complete a simple action. The instruction I had given was ambiguous and had left it in a quandry it was unable to solve. The computer gave me the same stupid, looped answer again and again. My friend's 6 year old son would have quickly understood what was wrong and offered a correct reply.

Clever? Stupid? These are human, judgmental words which I'm using to describe a machine that is neither. What it, or any other computer is, is logical. Words like clever or stupid do not apply — or certainly not at the stage computers have so far reached. In this issue of ***CCI***, we have the first of a fascinating two part series, looking at the future of computer sound. To get a computer to make even simple conversation is a difficult task. And though both the 64 and the Amiga can be easily made to talk, they cannot be easily made to talk intelligently. Not only have they not been created to carry out the complex and largely human function of communication of flexible or abstract ideas, they just don't have the sheer power needed even to get close to the most basic level achievable by normal human beings.

That is not to say they will never reach a higher "human" dimension. Power is being added all the time. Want to build your 64 up to 256K — the original Amiga standard? Read the article on it in this ***CCI***. But 256K is way short of what is needed to allow us limitations. But that computing power may be coming ...

Now, hands up the reader(s?) who knows what BIPS are! Yes, of course, you and I know it means billions, yes billions not million transistors at 250 Mhz speed ... Well, you could talk to a computer with power, couldn't you? and probably get a relatively sensible answer.

Science Fiction like the book reviewed by Daphne Moss in this issue? No, Intel, the world's leading chip manufacturer and creators of the PC chips 286, 386 etc has let it be known that it is working on a chip called Micro 2000 to be released in the year of that number. The first chip of the next century, only eleven years away, will have those wonder specifications with a couple of billion BIPS. On the way and a mere seven years from now — and remember that the 64 has been around that length of time — there will be a 686, hardly crammed with a mere 16 million transistors ...

Of course, a computer that will exchange intelligent conversation, make decisions and carry out complex intellectual tasks without supervision, as humans, even very young ones do all the time, may just be impossible. No-one has yet discovered how our own brains really work — or even defined the distinction between brain and mind.

Perhaps Intel's futuristic plans will turn out to be, as so much in the electronic world, nothing but vapourware. You can read about that in Commodore terms in the amusing article from Joe Griffin we publish this month.

However, as we see in examining the ever-interesting story of the major UK entertainment software company, US Gold in this issue, it is with humans, more the challenges to which they respond than other limitations that define their ability to succeed. Almost nothing, it seems, is impossible — particularly for an Indiana Jones — or a Geoff Brown-type.

We may have seen, in SF films like "2001", that computer HALs evolve toward the human in their lust for power and urge for survival. But that is Science Fiction. I heard the other day that no-one has been able to design a computer version of the oriental game "GO" that could beat any competent human player — for winning at "GO" relies not on logic but creative play. There is also same the inability of electronic chess machines to match the human grandmasters ...

As President John F. Kennedy said, "Man is the most extraordinary computer." But nobody knows yet the power of the BIPS we employ. Electronic computers may equal that power some day but they will still, maybe inevitably, remain logical. Human beings don't have to be. Human beings are frequently illogical. They can be stupid and self-destructive but they are not bound by the rules. They need never get stuck in mechanical loops. They can break out by leaps of creativity and solve problems to which logic will never provide the answer ... 6 year old boys or girls do it — all the time. Now show me a computer which can do that and I will call it clever. But you can bet then that sometimes it will turn out to be stupid too ... be stupid too ... be stupid too ...

Antony H. Jacobson
Managing Editor and Publisher

COMMODORE COMPUTING INTERNATIONAL

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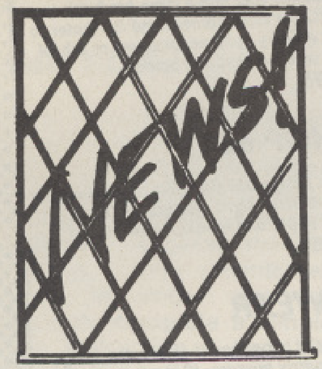

'Prophecy'

Prophecy, the new role-playing adventure from Activision U.S., features one of the largest weapon inventories of any role-playing game, the company claims, along with and advanced combination of graphics and role-playing. It begins in CrissCross, a little village left in ruins by the evil Krellane, ruler of the Gendorian Empire. Living in constant fear of being discovered, the people of CrissCross dream of the day that the hero of the Prophecy will appear and vanquish Krellane. But now, as the nightmare becomes reality, players find their family and friends slaughtered by the hands of the powerful Empire.

Unarmed and alone, Prophecy players set out on a quest to save the world from Krellane and his Empire. Guided by lightning reflexes and quiock wits, players fight through numerous obstacles and meet up with unusual creatures in search of vast treasures and clues to unlock the puzzle that help to defeat Krellane.

Travelling through the seven dungeon levels, where every turn in the path is different, players can meet up with more than 20 animated, individually rendered monsters. Through interaction with Non-Player Characters, players obtain clues to locate weapons and gather magic spells needed to undo the dark secret of Castle Trinadon.

Phrophecy offers an aerial view of dungeons and an on-screen storyline that reveals key plot twists at crucial moments. Teleportation moves the player from level to level and from danger to danger. The hands-on combat action enables players to maim their enemy with a swing of the halbard, raise their shield to ward off blows, or be killed by their attacker with a single blow. Danger abounds as players may also contract diseases or become poisoned by their enemy. Using the creative spell system, players can memorise and then cast dozens of graphically illustrated magic spells, which when modified by a combination of prefixes, create different effects. Available for MS-DOS and 100% compatibles. Price: £24.99.

Educational Media

Do you have problems finding educational programs? Rickitt Educational Media have informed us they operate an efficient software mail-order business. Programs are available for all Commodore computers and are suitable for pre-school learners as well as students studying for GCSE.

Three Directories are published each year: A Primary Edition, which lists around 500 programs, a Comprehensive Edition comprising of over 1,000 and *The Educational Software Selection* which is a compilation of over 80 of the best educational programs from a variety of the leading software publishers. Contact: Rickitt Educational Media, Ilton, Ilminster, Somerset TA19 9HS. Tel: (0460) 57152.

Cashbook Controller

In its simplest form, the program will replace Cash and Petty Cash Books, but Digita's program, in effect, does much more. They tell us it is simple, fast; ideal for small businesses wishing to computerise their existing manual cashbook systems.

Final Accounts (rrp £29.95) is also available from those users wishing to produce End of Year accounts. Price: £49.95

Citadel

Martin Walker, author of the highly acclaimed 'Hunter's Moon', has just unveiled his latest creation — Citadel.

Signed to Electric Dreams, Citadel has been written specifically for the Commodore 64. A game that includes both arcade and strategy, Citadel takes you into a world of underground cities, deserted for many years on a now uninhabited planet. Discover a way through the labyrinth of corridors to penetrate the secrets of these forgotten cities.

The game features board game-style tactics, which allow the player to stop and consider the next move, whilst in a non-combat situation. There are eight completely different cities to explore and conquer, each with a split level maze. Martin has included 128 screens of smooth scrolling graphics, and a sprite multiplexor is used to maximise in-game action, Activision tell us. Commodore 64 — (cass) £9.99 (disk) £14.99

MicroProse Games

MicroProse Software Inc., already known for producing state-of-the-art, innovative entertainment software, will begin developing arcade game technology as well as coin-op, MicroProse Games (MPG). The first product from this division is due around Autumn of 1989.

MPG plans to design and produce coin-op machines conversions using completely new processors, designed to cope with the amount of processing needed to generate the graphics for the game. According to Chuck Grempler, Director of Engineering at MicroProse Games, the result will be immediately noticeable to even the most casual arcade gamer. 'The technology we're developing will bring a whole new environment of realism and excitement to arcade games,' he said.

Much of the advanced technology will be seen in the form of 3D graphics, which will draw on polygons for the multi-dimensional effect. The use of polygons is nothing new, but the amount that will be drawn is. The most sophisticated arcade machines to date, according to Grempler, generate up to 12,000 polygons per second. MicroProse Games plans to produce 60,000 polygons per second. In addition, the screen will regenerate at a rate of 30 frames a second, which is actually faster than the film speed of motion pictures.

As yet untitled, the game, according to Grempler, will most likely be a combat flight simulator — a genre for which MicroProse has earned a strong reputation. MicroProse Games will draw on the technology developed for F-19 Stealth Fighter as it designs its first arcade flight simulator.

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LC10

Hugely successful 9 pin printer, the Star LC10 provides 4 NLQ fonts (with 96 print combinations) at 36cps and 144cps draft. Has a large 4K buffer and IBM/parallel interface built in. Includes a comprehensive front panel operation and features paper parking, allowung single sheets to be used without removing tractor paper.

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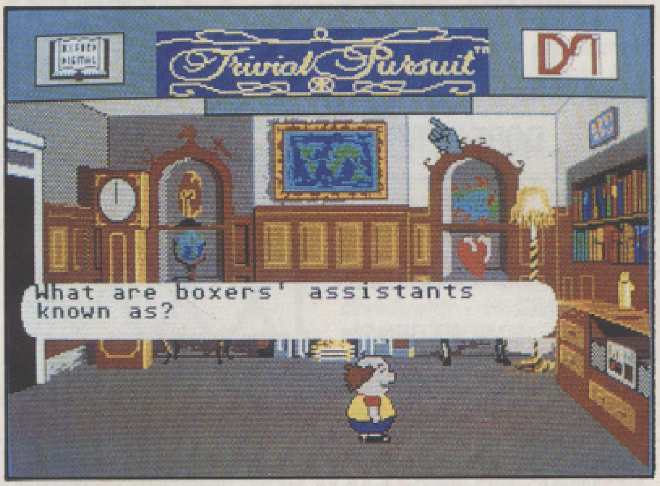


What are boxers' assistants known as?

Trivial Pursuit

Amiga-Genius™ Edition

Everyone who owns an Amiga is already a genius, but do you know the answers to the following questions: What is Desperate Dan's favourite food? What is Triskaidekaphobia? How many golf balls are on the moon?

And if not — who cares! It's the sheer fun and challenge of Trivial Pursuit, says Domark.

Soon to make its debut is the Amiga version of Trivial Pursuit-Genius Edition. Although Trivial Pursuit remains faithful to the board game, fresh questions have been added with sound and music questions including the naming of tunes which are played backwards. Graphical questions flick up on screen to be puzzled out before the time limit.

With over 3,000 questions, Trivial Pursuit will either make you a genius or drive you bananas. Price: £24.00.

Passing Shot

Imageworks are planning to bring you the ultimate tennis sensation. Passing Shot, a coin-op licence secured from Sega Enterprises Ltd., promises to give home computer users many thrills as the wide variety of options available on the coin-op will be transferred to all home computer versions.

Passing Shot will be converted to all the major home computers by Teque, who converted Blasteroids, among others.

In Passing Shot, you play the Grand Slam season with doubles or singles championships taking place across the globe covering both clay and grass courts.

Plus you call shots! As Passing Shot offers a variety of gameplay options with the player controlling the positioning direction and type of shot (eg slice, lob, spin). Meanwhile the court scrolls around the screen ensuring that you don't miss any of the action. With two different viewpoints the game begins with an eye-level behind the server, then as the ball is successfully served the game changes to an overhead perspective, Imageworks tell us. Start warming up for Passing Shot it's going to be a long, hard and exciting season!

Passing Shot will be published for the Amiga and C64 this Autumn.

Computer Hacking — The Party's Over

Computer hacking is big business. Conservative estimates now put the cost to British industry at more than £400m per year, with many of the UK's top companies already hit.

Any computer connected to the public telephone network is at risk. 'Com-Lock', from leading security specialists Cream Communications, is a new device that operates as a gate between the computer's modem and the telephone line. Entirely independent of the modem, it can therefore offer a number of key advantages over previous methods of data secuirity. Contact: Cream Communications Ltd., Unit C3, Hovefields Avenue, Nore Industrial Estate, Burnt Mills, Basildon, Essex SS13 1EB. Tel: (0268) 728577.

Activision's Line-up

Activision has announced their line-up of major arcade licences for release during 1989. Continuing their relationship with SEGA, Japan's leading producer of state-of-the-art arcade coin-ops, Activision now produces six of SEGA's best titles from earlier this year: Power-Drift, Galaxy Force, Altered Beast, Hod Rod, Super Wonderboy and Dynamite Dux. Two more arcades, Ninja Spirit from Irem and SNL's Fighting Soccer will also be released later this year.

Activision will also release shortly Ghostbusters 2. The original Ghostbusters computer game, also published by Activision, sold over 2 million units worldwide and still remains the best selling computer game of all time, the company reports.

Development on all of these great games is already well underway, with some of Europe's finest programmers assigned to making the transformation from coin-op to home micro.

Mazemania

Flippo must travel through the maze of Tubular Bells turning the tiles as he goes. Avoiding the gliding aliens that appear to hinder his quest. Mazemania is Hewson's latest release. In the game, you collect icons to gain extra power, and you bound over the star-spangled black holes to avoid being suspended and zapped of a life.

Gyrate the whole maze to transport to the next level — The vegetable garden, whee the pursuit is even more adverse!

Wulfpack

Wulfpack, by Blue Ribbon, takes you right into the action. Operation Overlord has commenced and you as Commander of a destroyer are to play an important role patrolling the mid-Atlantic. Your brief is to keep vital supplies for Europe. All too often their ships are being blown apart by marauding enemy U-Boats.

Using your battle skills to the full the confrontation begins. You have located an enemy Sub: Battle stations are called and the Depth Charges are away. Provided you have judged the depth of the enemy correctly it's curtains for them.

Price £2.99. Available for Commodore 64.

Plan/IT v3.0

Plan/IT v2.0 has now been discontinued but only owing to its replacement by Plan/IT v3.0. In addition to the extra features now offered by the new version the advertised price of Plan/IT v3.0 has been reduced from £139.95 to £126.50 (vat inc). Purchasers of Plan/IT v3.0 at the old price will receive a refund of the difference. Among the features now offered by the new version are full Lotus 123™ worksheet import/export, Arexx™ support, Dataview mode in the database plus a unique Outline mode allowing different levels of spreadsheet data to be viewed on screen, according to the level assigned to the data. In addition some of the routines have been speeded up and some additional user options made available.

Maxiplan owners may like to consider an upgrade scheme under which they can receive a copy of Plan/IT for £50 + vat. In addition owners of other spreadsheets wishing to obtain a copy of Plan/IT v3.0 are welcome to contact Best UK Ltd to obtain a 'trade-in' value of their existing software.

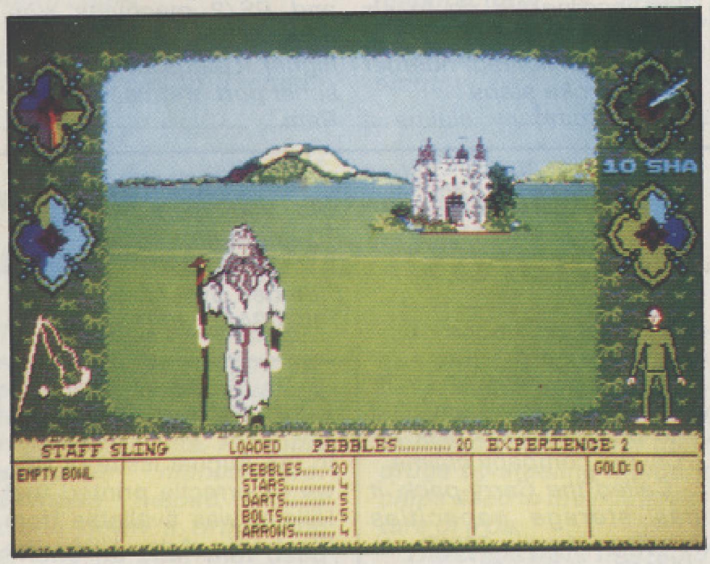
Contact: Best (UK) Ltd, Block 3 Unit 1, Baird Avenue, Strutherhill Industrial Estate, Larkhall, Strathclyde. ML9 2PJ. Tel: (0698) 887770.

Time

TIME has been released by Empire. The company describes it as an animated journey through the ages set some time in the future in the gallery of a satallite orbiting the Earth.

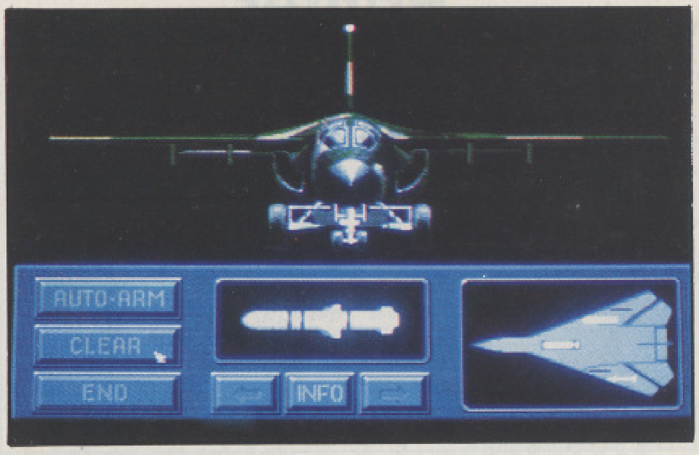
The visual aspect of this game is its high definition animation using a new state of the art character generator, allowing thousands of frames of animation to be described in under 100k of data, Empire tell us. In addition there will be over 200 fully animated characters. It will be available for the Amiga and IBM PC shortly.

Sleeping Gods Lie



A real time fantasy that combines fast action and combat with the thrill of adventure, Sleeping Gods Lie is a new release from Empire that the company claims is an epic 3-D game fought over 64 landscapes, drawing on megabytes of high-resolution graphics. Created over two years by the award winning Oxford Digital team, it is available for the Amiga and IBM PC.

Activision Signs Up Vektor Grafix



Activision has signed up the Leeds-based development house Vektor Grafix, whose first project BOMBER — Tactical Air Combat, is due for release shortly.

Vektor Grafix will produce four original titles. BOMBER Tactical Air Combat is a multi-aircraft flight simulator. Now nearing completion on six formats, BOMBER T.A.C. has been in development for over nine months.

The game will feature aircraft such as the Tornado IDS (Britain's MRCA front line strike aircraft), the F-4 Phantom, the F-111F Aardvark, and the Mig-27 Flogger D (the Soviet Black low level attack aircraft).

Whereas most flight simulators concentrate on fighter aircraft, BOMBER T.A.C. is angled towards the interdictor/strike multi-role aeroplane, Activision tell us.

Free Spirit Releases Planet Of Lust

Free Spirit Software announces the release of Planet of Lust, an adult graphic/text adventure for the Amiga (minimum 512K) series of computers. Planet of Lust is the (long-awaited?) sequel to Sex Vixens from Space.

In Planet of Lust, Captain Brad Stallion and his space vehicle, the "Big Thruster", return on a mission to thwart another galactic evil-doer. In a press release that can only be described as undescribable, Free Spirit claim that the graphics and playability of Planet of Lust are substantially enhanced over Sex Vixens from Space, and that the music and sound effects are quite unique. No doubt they are.

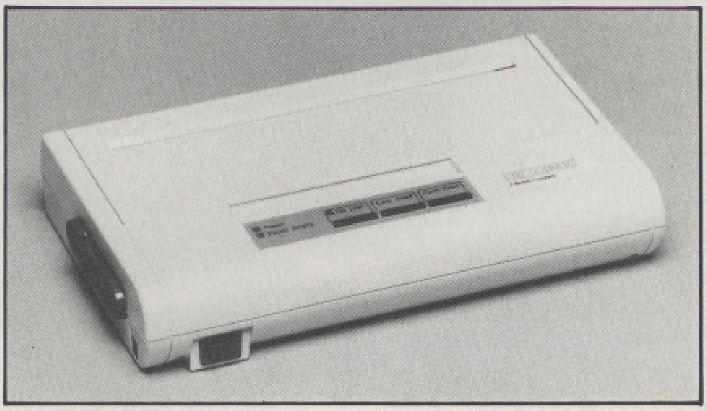
Planet of Lust for the Amiga, price: $39.95 (US). Contact Free Spirit Software, P.O. Box 128, 58 Noble Street, Kutztown, PA 19530 (USA). Tel: (215) 683-5609.

Photofile

Photofile is a digitising service for the Commodore Amiga computer. The company has informed us that they are moving offices shortly. The address will stay the same but the phone number will change to (0602) 261498.

Readers can obtain an information sheet by sending an sae to our PO Box number, or £3.00 for demo disk and an information sheet. Contact: Photofile, PO Box 196, Nottingham NG2 4GQ. Tel:(0602) 481997.

DICONIX 150 Mains/ Battery Portable Printer



The Diconix 150 ink-jet portable prints at 150cps draft and 50cps NLQ, and measures only 50.8 × 275 × 165mm, weighing 1.7kg complete with batteries. It is available from Action in serial and parallel versions.

The 150 is Epson/IBM compatible, and will print single sheets up to 9in (228mm) wide, continuous forms, fanfold stationery and film for overhead slides. It has a 2K buffer, and has three integral fonts plus condensed, subscript and superscript.

Contact:
Action Computer Supplies,
Abercorn Commercial Centre, manor Farm Road,
Wembley, Middx, HA0 1WL.
Tel: (0800) 333 333.

The Survival Of The Fastest

Electronic Arts has announced release dates for the PC versions of Ferrari Formula One. Already one of Electronic Arts most successful Amiga titles, Ferrari Formula one is the complete Grand Prix racing game bringing together the action and excitement of driving legendary Ferrari Formula One car with the strategy of managing a team.

Ferrari Formula One offers high speed action on authentic recreations of all 16 tracks from the 1986 season, including Monaco, Detroit, Monza and Brands Hatch, plus two additional tracks so the player can race the complete 1989 season. Each circuit is modelled down to the background scenery, weather conditions and the length of track. Players may choose to race on a favourite track at any time or take on the strategic challenge of managing a duplicate of the entire 1986 or 1989 Formula One season. The opposition consists of eight of the world's top drivers, including Alain Prost, Nigel Mansell, Ayrton Senna, each with their own unique driving styles.

The PC version of Ferrari Formula One supports Hercules, CGA, EGA and Tandy graphics mode. It will run on VGA machiens in EGA mode. Price: £29.99.

Kudos to F-19 Stealth Fighter

F-19 Stealth Fighter, MicroProse's highly-acclaimed combat flight simulator based on the radar-elusive jet, was named Best Simulation at the Software Publishers Association (SPA) Awards Ceremony, held in San Diego, California recently. Stealth Fighter becomes the first MicroProse title to earn an SPA award.

"We are extremely honoured", said MicroProse Managing Director Stewart Bell. "It's an excellent reward for all the hard work, dedication and craftmanship that went into the game, and it's a clear signal to computer gamers everywhere of the kind of quality, technology and innovation that MicroProse put into all it's products."

Bell said that despite it's commercial success — over 100,000 units sold to date — a SPA award is a unique thrill that sales records can't equal. "F-19 was up against some very classy competition for Best Simulation. I am very honoured that the SPA membership picked F-19 Stealth Fighter. This is a moment I'll never forget."

A new mouse species

A cross between a keyboard and a mouse has been developed by United States firm, Prohance Technologies.

The Powermouse has a 40-key, built-in keypad and each user-definable key can incorporate up to six different functions from a virtually unlimited number of keystroke steps.

The company claims it would take only four clicks of the Powermouse to perform the copy and moving function of Lotus 1-2-3, compared to the 52 keystrokes normally required.

The mouse's keys come preprogrammed for common spreadsheet functions. Users can also redefine the keys for use with other applications.

The Powermouse can be used with IBM PC, XT, AT and PS/2 machines running DOS Version 2.0 or higher. It plugs into a RS232 serial port and uses 20K of Ram.

Portable PC hard disk

Advanced Computer Technology has produced the first portable hard disk for PCs, the company claims.

Called the Carry-pack, it has storage capacities ranging from 20MB to 100MB and with access times of 40ms to 12ms. A special PC connector is supplied with the unit.

The company says it can be used as the main hard disk, a second hard disk or as a back up. It is compatible with IBM PCs and PC-compatibles.

Price: £600. Contact: Shandell Systems, Tel: (02407) 2027.

Paladin

Artronic Products has released the second entertainment title resulting from its recent licensing deal with top United States developer Omnitrend Software.

Paladin will be available here for the IBM PC and compatibles, priced £24.99, and Amiga, price £19.99.

The tactical combat game has elements of fantasy, strategy and role-playing — plus animated graphics and digitised sound on the Amiga version.

Correction

In the August issue of CCI, we incorrectly printed that Hillsfar was available from Electronic Arts, USA. We should have noted that US Gold distributes Hillsfar, as they do all SSI titles, in the UK. Our apologies.

Correction

The 'nice' boy next door may be a (gasp) HACKER!

As computer crime proliferates, sociologists and other 'people watchers' are beginning to define the criminals more carefully. For example, hackers and insider computer fraudsters are two very contrasting breeds, says Dr Robert Taylor, an Associate Professor of Criminal Justice at the University of Texas.

In a report on seminars given by Taylor, he found typical hackers to be young, male and middle-class ranging from 14 to 25 years of age. Their parents rarely suspected them as they appeared to be 'model' kids who do not race cars, chase girls, drink beer or get into trouble.

Warning signs of likely insider computer fraud include alcohol and drug abuse, loan shark involvement and excessive gambling. (See this month's news item on Compaq).

The general consensus is that insider fruadsters may be neurotic, manic-depressive, arrogant or psychopathic while typical hackers are likely to be withdrawn loners.

In other words, former hackers should make ideal employees while Peter Pan would be a prime suspect in any hacking investigation.

It is, however, important to note: only schizophrenics are capable of both activities.

Michael Jackson, I presume?

VPL Research has devised an input tool called Dataglove that allows users to "grab" a computerised image and move it across the screen.

The company claim it could eventually replace keyboards and mice for some applications.

How it works: Dataglove picks up the image through a series of optical sensors which sit on each joint of the hand. The glove is connected to an external box, the size of a personal computer base, via a fibre-optic cable. This performs analogue-to-digital conversions so that the optically recorded impulses can be translated into data and transformed into images by the workstation.

Price: $8000 (U.S.).

Portable LQ Printer

A portable letter quality printer has been launched by Toshiba Information Systems called the ExpressWriter 301, it weighs less than 4lb, uses thermal technology and costs £345. The rechargeable internal batteries allow for up to an hour of uninterrupted printing; alternatively, the unit can be powered from the mains.

Resident emulations include Epson LQ and Toshiba P321SL/Qume Sprint 11, while resident fonts include Courier, Prestige Elite, Draft, Condensed and Proportional. In draft mode, the printer runs at 60 CPS, while letter quality output is at 42 CPS, according to the company.

Static RAM chip production begins

Chip manufacturers will soon begin mass production of 1M-bit static random access memory (S-Ram) chips.

Produced by Hitachi, EC and Toshiba, the chips will use sub-micron technology comparable to 4M-bit dynamic random access memory (D-Ram) chips.

Sony, another big chip manufacturer, is already producing quantities of S-Rams at its Nagasaki plant.

HI-TEC EC2400

The EC2400 is a quad speed modem with features such as MNP level 4 ERROR CORRECTION which gives you very reliable Data transfer; and, a MNP level 5 DATA COMPRESSION which approaches 4800 bps nearly doubling the speed of your Data transfer.

It is housed in a black custom ABS case measuring only 46 x 163 x 200mm and weighing a mere 1050g (which includes the built in power supply).

BABT approval is forthcoming. Price: £279. Contact: Hi-Tec, 611 Lincoln Road, Peterborough, PE1 3HA. Tel: (0733) 52440.

Hi Tec EC2400
QUAD SPEED MNP MODEM

Just say "no"? Just say "Compaq"

The US has developed a reputation for strange applications. In this situation, the application had far-reaching results. Personal computer manufacturer Compaq helped police close down a drugs ring among its staff that used money from stolen memory chips. Reports have stated that the police charged 22 people, all employees of Compaq at one time, with theft and trafficking in drugs.

Someone within the company helped undercover police officers infiltrate the ring in which the Compaq staff paid for their drugs by stealing memory chips used in the manufacture of PCs.

The chips were then sold for cash or directly traded for drugs. Because memory chip prices reached record levels last year (due to high demand and import tariffs) business was booming.

Autoroute Plus

Autoroute Plus, a greatly enhanced version of the well-known Autoroute package, is a route planner for road journeys that lists over 30,000 place names and over 67,000 miles of UK roads, and allows up to 25 stop-offs in each journey.

Available from Action Computer Suppplies at £242.00 (RRP £299.00), Autoroute Plus uses maps prepared from Ordinance Survey data, the screen display showing road numbers and place names in colour. It gives accurate mileages and times, producing highly detailed maps and route instructions, and can be instructed to avoid stretches of road where there are known to be hold-ups.

Autoroute Plus will run on IBM PC, XT, AT and PS/2 or compatibles, requires Hercules, CGA, EGA or VGA display, and supports HP Laserjet and Epson FX/MX compatible printers.

Action sells leading brands of computer supplies, hardware, office automation and datacomms equipment, magnetic media, software and furniture at discounted prices directly to computer users through its 384-page free catalogue. Action provides a free telephone service for orders, sales enquiries and catalogue requests on 0800 333 333.

Action Computer Supplies, Abercorn Commercial Centre, Manor Farm Road, Wembley, Middx, HA0 1WL. Tel: 0800 333 333; Fax: 01-903 3333; Telex: 922493 Action G.

No-fault storage

Europe's first fault tolerant storage array subsystem for IBM PCs, PS/2s and compatible computers is now available from Meltek.

Known as Pacstor, the subsystem is an array of up to six 3½" hard disks. By distributing data, the company claims data is never entirely lost. If one drive should fail, it can be replaced when convenient and data can be reloaded on to that drive from a tape cartridge back up.

And that's not all. Fault tolerant software is available with the six drive version. This, says Meltek, means that no data is lost if a drive fails. It does this by adding the information across the drives. If one drive goes down, the software can deduce the missing information and recreate it.

Meltek wants the system to replace the large drives which are becoming common in computer systems, particularly the greater than 500Mbyte devices. Here, the company says, a disk failure brings the whole system down.

Pacstor units are available with capacities ranging from 120 to 600Mbyte and these are compatible with DOS, Unix, Xenix, Novell and 3COM based equipment.

48-pin Printer

Epson has released the TLQ480 dot matrix model. The TLQ4800 is the world's first 48-pin dot matrix printer which gives it laser quality output combined with the wide carriage of a conventional dot matrix device, Epson claims.

The company also says that the resolution of 360 by 360 dots per inch has a better output than most lasers.

The TLQ4800 has a draft speed of 300cps and a letter quality speed of 100cps. It also supports ten typestyles – including OCR-A and OCR-B – and 14 international character sets.

Hostile All Terrain Encounter

Gremlin has announced the release of Hostile All Terrain Encounter. The year is AD2320 and the Galaxy is in turmoil. With the alien threat ever increasing, a lack of experienced assault personnel is severly undermining the defences of civilised sectors. You are needed to repel the hostile alien forces — but first you must qualify. Prepare to go to Stripworld, the training ground for all galactic fighter pilots.

Initially controlling a Star Fighter, plasma cells lining the route must be collected and taken through the barrier. Beyond it, a Ground Assault Vehicle is waiting for you, ready to use the cells for power. Manoeuver it to the next barrier, again collecting plasma cells on the way to power a waiting Star Fighter. This will continue until you can advance no further.

The plasma cells have a protective outer shell which has to be destroyed to expose them. To test you to your limit, simulated alien defences line the way and must be overcome. Ground skimming projectiles, intelligent missiles, enemy Star Fighters, Mine Harriers and many more obstacles will challenge your ability to progress.

Only total annihilation of all enemy targets will ensure your safe passage through 30 levels of Hostile All Terrain Encounter.

Available on: Commodore 64/128, £9.99 (cass.), £14.99 (disk); Amiga £19.99.

ICAL chooses

The ICAL consortium, which comprises of 13 British colleges and universities, has chosen the 100% British *TopClass* authorising system as a running mate to the American *Accord* system it has been using since 1987. This means that each of the members of the ICAL consortium will be receiving over £2000 of authoring software.

The introduction of TopClass means that consortium members can create software that can be shared amongst its members as well as being made commercially available in order to fund further courseware development. (Accord requires a Unix environment and high-level graphics whilst TopClass runs on ordinary PCs).

Electronic Shopping in 1992

International trading and telecommunications takes to the home. Thanks to Kays, which runs the existing successful U.K. Videotex teleshopping service, users of the Belgian Telecom (RTT) National Videotex service can make low cost International calls direct to Kays computer in England, using a Minitel type Videotex terminal or personal computer.

Then shoppers can access free of charge Kays existing teleshopping service to obtain a free 1,000-page full colour catalogue which contains circa 35,000 items of merchandise (everything for the family and home — ladies, mens and childrens fashions, furnishings, electrical goods, etc. etc.).

Shoppers can then choose any item from the catalogue and use the teleshopping service 24 hours a day, 7 days a week. Goods ordered are despatced from Kays own warehouse in England and are despatched via Air Parcel Post and the postal system of the country concerned. Contact: Kay & Co. Ltd., Elgar House, Shrub Hill, Worcester WR4 9EN. Tel: (0905) 23411.

Great things in store for 1.4!

The 1989 North American Developers' Conference

Tim Grantham reports from the USA

Commodore Business Machines unveiled its most ambitious system software enhancement program ever at the annual North American Amiga Developers' Conference in San Francisco, Calif. Although Amiga software manager Andy Finkel emphasized that the features of Amiga DOS 1.4 had not been finalized, it became clear to the over 300 third-party software and hardware developers in attendance that almost every part of the Amiga operating system would be affected.

The watchword of the planned enhancements is 'compatibility'. Almost all software written to run under Workbench 1.3 will run under 1.4. Only those programs that, in contravention of CBM's programming guidelines, access private data structures within the operating system, may not work as intended.

The most obvious difference for users will be in the graphic interface. Harry Copperman, CBM's new president of its US operations, announced that the company has hired an artist to redesign the look of the Workbench, to give it a more 'professional' appearance.

But the changes to Workbench are not simply cosmetic. Users will be able to double-click on an icon to load and run a program and, *while that program is loading*, double-click on another icon to load and run another program. In other words, Workbench will become multitasking.

Another enhancement to Workbench will solve an apparent problem for many new users of the Amiga. If a disk does not contain any .info icon files, double-clicking on a disk icon pops up an empty window. Only the file gauge on the left side of the window reveals that the disk contains files. Workbench 1.4 will use a text window to display the names of all files on the disk and even treat them as icons: the user will be able to double-click on a program name and Workbench will load and run it. All the other operations usually associated with icons, such as select, multiple select and drag, will also work on file names.

Another big plus for users will be the incorporation of Fast File System (FFS) into Kickstart. This will permit the use of FFS for floppy disks as well as hard disk drives. Old File System will still be available, subsumed into FFS, to maintain compatibility.

Workbench 1.4 will also support the Enhanced Chip Set. The new custom chips, which consist of the *Super Agnes and Super Denise* chips, replace the current versions in the A500 and the A2000 (they cannot be used in the A1000). CBM is already shipping machines equipped with the Super Agnes, which can address a full 1 Mb of graphics (CHIP) memory.

The Super Denise chips will provide a variety of new screen modes, including a so-called 'productivity' mode that features 640 × 480 *non-interlaced* resolution, with four colours chosen from a palette of 64. This mode requires a multiscan or bisynchronous monitor; it cannot be viewed with a standard Amiga monitor. Other modes include a 1280 × 200/256 (1280 × 400/512 interlaced) mode, again with four colours out of a palette of 64, that *can* be used with NTSC and PAL Amiga monitors.

The Super Denise chip will also provide enhanced genlocking capabilities. Any one bitplane will be genlockable and any one colour register can become the 'transparent' colour.

What does this mean for users? The extra CHIP memory will let them run more applications before running out of graphics memory: *DPaint III and Professional Page* could both be run at maximum resolution and maximum number of colours at the same time. Those users into music will be able to play back larger sound samples. Those with genlocks and the right software will be able to use animated chromakey effects for desktop video. The new 32 Kb × 32 Kb blit size (currently 1 Kb × 1Kb) will provide smoother, faster animation.

The Super Denise chips will be made available when the 1.4 software is released. CBM made no commitments to dates or prices, a wise move given the scope of the upgrades. My guess would be at least twelve months.

Developers were very pleased to hear that AREXX, the interprocess communication language ported from the IBM world by William Hawes, will be put on every Workbench 1.4 disk. AREXX provides a way for different programs to talk to each other. For example, a spreadsheet program that supports AREXX would be able to pick up financial information from an AREXX-compatible communications program *as it was being downloaded*, massage it and hand it over to an AREXX-compatible word processor for formatting and printing.

Developers were also heartened by a number of marketing strategies announced by Copperman for the US market. While most of these will not have a direct effect on the British market, they are crucial to the company's future financial well-being. They include the establishment of a VAR (Value-Added Reseller) program, a revamping of the dealer network, more dealer training, development and marketing partnerships with selected developers, a greater focus on the university market (especially with the UNIX Amiga) and an ambitious advertising campaign.

Two announcements *will* affect users in the UK: first, a commitment to more funding for research and development for the Amiga product line; and second, a new emphasis on a consistent user interface across applications. In the latter case, Commodore will encourage developers to use standard system services, to be provided in 1.4, rather than their own customer requesters, gadgets and menus. This will help users of one program learn to use another more quickly. The Apple Macintosh has proven to corporate America that this approach provides big savings in training costs. Commodore will not be as rigid as Apple in enforcing these principles with its developers; but the redesign of the Workbench and the development of standard file and font requesters shows they have recognized the value of a consistent way for users to interact with the Amiga.

Commodore also announced the development of the Amiga 3000. The company would only say publicly that the new computer would employ a Motorola 68030 microprocessor on the motherboard.

Developers left San Francisco tremendously excited by Commodore's plans, and impressed by what many perceived as a more professional attitude on the company's part. Whatever products finally emerge, users can also be assured that CBM is not resting on its laurels.

T.G.

Home Designer 128

Bob Collyer surveys a CAD product that could have you designing your future home in your own home right now.

From Nuclear Subs to Bath Tubs, Computer Aided Design (CAD) is universally becoming an industry standard. Modern day draughtsmen, using the power of computers, create perfect images accurate in every detail, time and time again.

Designers also have tools which they can use in much the same way as secretaries use a word processors. Both of these applications contain many of the same benefits. For instance when using a word processor you can correct your mistakes on screen before committing the end product onto paper; CAD allows you the same flexibility. Changes can be made easily then printed, thereby eliminating the old problems of time-consuming redraws using pen and ink.

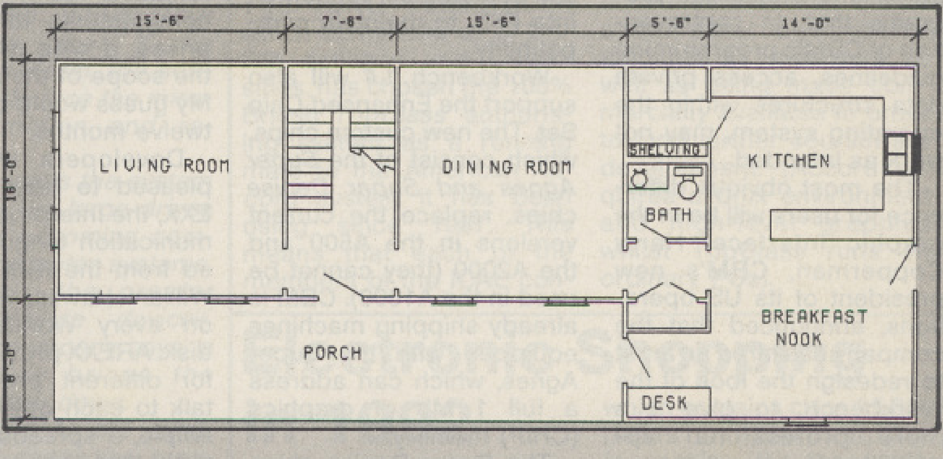
The accuracy of CAD, with the constant ability to get it right to the nearest thousandth of an inch, is probably the most important benefit over the more traditional less accurate hand held pen and ruler method. CAD also allows you to quickly and easily make very drastic alterations to a drawing; this process is only possible thanks to its development on a computer.

> ***"The accuracy of the final product is therefore, limited to the resolution of your computers display."***

Home Designer 128 was developed in 1987 by K & K Software especially for the C128. It is important to note that you need not own a 1351 mouse, although it does help to pick up commands from the menu on the side of the screen.

Drawing Methods

The 40 column screen display does not give the sharpest of resolutions possible on screen due to the object orientated drawing instructions. There are basically two different types of CAD packages. The first type is based on bit mapped graphics. This means that all data entered into the program is stored in the bit mapped screen display. The accuracy of the final product is therefore, limited to the resolution of your computer's display. Eighty columns would be better than 40 but the same limitations apply.



The second type, which includes this program, is 'object orientated'. In this type of program, the data is stored in the form of individual lines, circles and text strings, not pixels that are turned either on or off. The drawing seen on the screen is a representation of this data scaled to whatever view you have selected. When you zoom in to magnify a small part of your drawing using a bit mapped program you only magnify the area, big fat dots is all you get. When doing the same with Home Designer you actually increase the resolution!

A good way to visualise an object based drawing is as a special type of database file. The program constructs the drawing on the screen and ultimately on your printer, using the structured file stored in the database. Generally, it is much better than the pixel based bit mapped method.

This program allows you to construct layered drawings. It makes it possible to create up to five drawings that can be layered on top of each other if needed. Using this feature, a detailed drawing can be prepared. For instance, your drawing could show the basic outline structure, over which could be an electrical wiring drawing, over that the plumbing and over that the heating and ventilating etc...

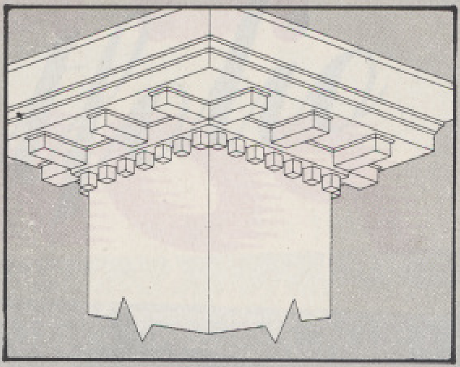
> ***"The main menu opens with a choice of four alternative modules."***

Yet although this program offers the best possible results from your printer or plotter,(the clearest drawings produced are those made by a plotter and not a dot matrix printer), in order to maximise these benefits you must be very familiar with approximately 60 or more structured commands. But take heart -- a couple of evenings intensive tuition will soon have you used to the language.

Modules

The main menu opens with a choice of four alternative modules. The main program provides the drawing tool. A second module handles the output to printer. Thirdly a module to handle plotters, and finally a configuration module to customise your particular set up. Creating a drawing consists of writing program lines using commands and screen plot references. These take the form something like: #INS LIN :X5Y5,X10Y8 . A line will appear on the screen between the x/y reference points. In this way, you construct your drawing. There is a handy library feature that contains some often used architectural symbols you can drop into the drawing.

A collection of standard figures such as plumbing fixtures, bath tubs and toilets, windows and doors are contained on the back of the main program disk. These save so much time, all you have to do is identify the centre point and scale of drawing, Home Designer will then find and position these in your drawing. Should you want to, you also have the ability to create your own user definable library figures to save repetitive commands.



Text can be added for notations and scaled up or down to fit as necessary. There is even a mergetext capability to take in text files from PaperClip WP. I was lucky enough, several years ago, to be able to design and build my own house. Those years must be described as 'BC' *before computers!* At that time I didn't own a computer, but if I were designing another house right now the answer to my draughtsmanship problems are here, in Home Designer. My wife would like to point out that if I had owned a computer in those days I would not have found the time to actually get round to building it!

"The accuracy and scaling detail are second to none."

Conclusion

The accuracy and scaling detail are second to none. You do not have to stick with designing houses, as I said earlier you could start with Bath Tubs and end up with Nuclear Subs if that takes your fancy.

This is a very serious tool that takes advantage of drawing using complex computerised algorithms to maintain accuracy. Handy features like circles, arcs, mirror and scaling help to give Home Designer a place in the disk drive of any self respecting C128 designer.

B.C.

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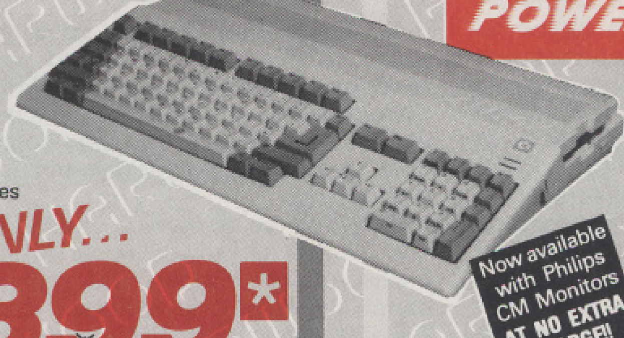

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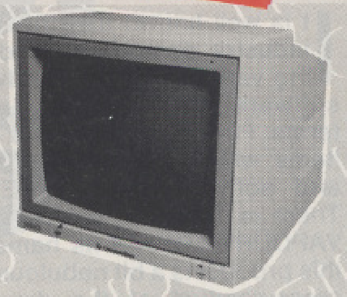

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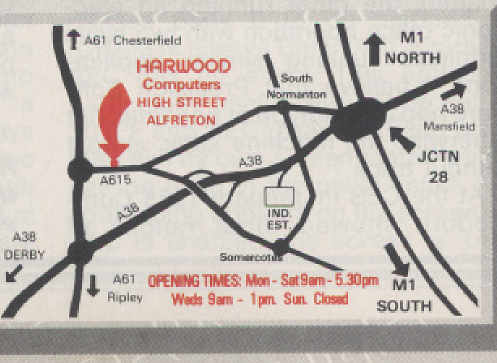

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Vapourware

Joe Griffin peers into the mist of software releases ...

It is well known that the computer industry comprises vendors selling various 'wares'. Hardware and software are now fully accepted terms. Firmware is used to describe items which fall between hardware and software such as EPROM's. There is, however, a fourth 'ware' — VAPOURWARE. As its name implies this product is a bit nebulous, being a cross-product of the development department and the salesman's hype.

Commodore have, over the years, established a strong reputation as suppliers of vapourware. I have in front of me the catalogue for The Third International Commodore Computer Show, held at the Cunard Hotel (now the Novotel) on 3rd - 5th June 1982. The catalogue devotes five pages to Commodore's NEW PRODUCTS. How many have you seen?

Commodore VIC 10, due in Britain in September — note careful advertisng does not state which year! Stated to be a 'Games Computer and music synthesiser' the features included: 40 × 25 colour text screen, High resolution colour graphics (320 × 200 pixel), Full keyboard music synthesis with 3 voices, etc.

Commodore VIC 30 (no delivery date given) stated to be the natural progression from the computing power of the VIC 20 and the colour and capabilities of the VIC 10, the machine included 8K of BASIC, 8K of Kernal ROM and 16K of RAM.

Commodore 500 range — this is questionably vapour, as a few machines were sold. For those who do not know of it, the spec included the colour screen and sound of the C-64, IEEE parallel bus, RAM expandable from 64K to 256K and a slot for a second processor.

Commodore 720 — the vapourware version of the 700, which had built-in floppy disks (these never appeared in the 700's but eventually arrived with the 8296D). The 700 was the machine which was going to take over from the 8000 series and keep Commodore at the forefront in business computing.

The final offering was the **Commodore 64** — the one machine of the batch which made it to the marketplace in reasonable numbers.

At about the same time there were rumours of two further products in the pipeline. One, possibly prompted by the appearance of the 8250 double-sided drive, was of a twin sided 4040. Needless to say this never appeared. The other was for the Teacher's PET. This was to be a C64 and monitor, enclosed in the casing of the 4032 PET, designed to be sufficiently rugged to withstand classroom use.

A year, or so, later Commodore announced the SX-64 portable (an excellent machine) and its vapourware brother the DX-64, these had respectively single and double built-in 1541 drives.

As I recall it Commodore's next offering in the vapourware market were the predecessors of the Plus-4 and C-16. This range of machines, shown at the Winter Consumer Electronics Show (CES) in Las Vegas in January '84 comprised the 164 (with membrane keyboard), the 264 (later to become the Plus-4) and the 364 (similar but with a separate numeric keypad). At a regional meeting of ICPUG that year Simon Tranmer demonstrated a talking version of Superscript, running on a 164 fitted with a voice synthesis chip. Obviously vapourware computers need disk drives and with these machines we were promised two new drives; the new super-fast SFD-481 (aka 1551) and a 'revised 1541' called the 1542. The latter never appeared.

In 1984, at the Commodore Show at the Novotel, ICPUG were given a preview of the new 'Zee Machine' a powerful new machine using a Z-8000 chip. The machine ran under a UNIX look-alike, multi-user operating system. A fast, powerful computer which was to be Commodore's IBM smasher. In his report of the 1985 Hanover Show, Tom Cranstoun mentioned that there were two of the beasts, one running a rolling demo (that would have put a Macintosh to shame), the other running an electronic office operation with two slave terminals running similar applications. I believe that Precision Software had a prototype at one time, but otherwise the machine sank, almost without trace.

At the CES in January 1985 Commodore showed three ranges of machines; the PC clone — based upon the Hyperion, the C-128 and the de-rigeur vapourware item, the LCD — a lap-top machine, weighing 3.5lbs and with 96K of business software built in.

Later that year, at the Commodore Show, I remember being in an ICPUG Seminar where John Collins spoke for some time about the new hardware. I have a vague feeling that he showed a C-128D (which had not been announced) and a 1571 (which had been announced but was not available). He also spoke about the 1570 single sided drive and the 1572 double drive, Commodore's first serial double drive. Did any of them make it out of the development lab?

At that same meeting John told us about the new 3.5 inch drive which had been developed; it appeared that it was at the production stage bu would not be released until Commodore managed to convince the software authros that it would be produced in sufficient quantity to justify their efforts in converting programs. This drive did eventually appear though it took a long time to come. Now there are rumours that a third edition of the C-128D is to be released, together with a matching C-64D, both having a built-in 1581, rather than a 1571. It will be interesting to see whether Commodore can bring these two machines into the marketplace or whether, like so many before them, they stumble en-route and turn to vapourware.

I am not particularly conversant with the Amiga equipment, but have a feeling that there Commodore have had far fewer items of vapourware along the way. I would be grateful for any information on Amiga vapourware.

Finally, least you all think that Commodore is alone in this field, I would draw your attention to the recent announcement by Lotus that Version 3.0 of 123 is to be delayed by a FURTHER six months, is this their build up to an entry into the vapourware field?

J.G.

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Care and Feeding of the C256

Paul Bosacki tells you how to fatten your C64.

It really wasn't that long ago that 64K was a lot of memory. But in five short years, we've gone from measuring 'enough' memory in kilobytes to megabytes. An Amiga comes with 512K, but apparently needs at least a meg to really show. We owners of the (dare I say it) venerable Commodore 64 have 64K and really little opportunity to expand beyond that other than the 1764 REU. But what if I told you that there is a way to expand the C64 to 256K, that you can do it yourself, and (best yet) I can promise you compatibility with GEOS? And maybe, just maybe, it can all happen for under £150.00. Interested? Read on.

This promised memory expansion comes in two parts. The first is a circuit whose construction is, I believe, not beyond the abilities of the novice. The second is the direct replacement of the memory chips with 41256's (a 256K bit DRAM). There is some interface wiring between the 64 and the mod board.

As you are aware, the 64K memory capacity of the C64 is dictated by the width of the address bus: sixteen bits. I have found an easy way to add two pseudo-address lines. These two new lines allow access to four banks of 64K each. When each bank is mapped in, the standard configuration of the C64 is unchanged, except that there is now 256K rather than 64K resident in the machine. By the way, Bank 0 is always brought into context on power-up. As well, a certain amount of Bank 0 is always available. This is necessary for two very important reasons. Although much of memory can be changed at will without consequence, there are certain locations that the Operating System and the MPU need to have available at all times; namely, system vectors and the stack. Consequently, these locations are never mapped out.

The modification

Three switches and two bits from the MPU I/O port are used to configure the additional memory. Briefly, P3 and P4 (the cassette write line and cassette sense line) provide the two pseudo-address lines needed to access the additional memory. By reconfiguring P4 to output and writing one of four two-bit codes to location $01, one of fou rbanks of 64K can be mapped in. This technique must certainly ring a bell, for it is by the same method that the ROMS are mapped either in or out.

Of the three switches, one allows the machine to be significantly reconfigured. It allows A10 to be considered when decoding common ram. If considered, common ram (CRAM) is from $0-$03FF. Otherwise, CRAM exists to $07FF. This option sets the default screen matrix within CRAM. The result is that, on a bank switch, the screen remains unchanged and 'common' to each bank. Another switch allows the AEC line from the VIC Chip to generate a CRAM call. If enabled, a low on AEC causes Bank 0 to be mapped in (CRAM is always Bank 0). If disabled, AEC has no effect. This option is particularly useful with CRAM set to $03FF and AEC disabled. Each bank then has its own screen matrix which can be used in the usual sense (i.e. your typing appears on the screen). If AEC is enabled, the screen is 'protected'. It's visible, but the contents cannot be directly modified from the keyboard. Through these options any number of screens are made available without stealing Bank 0 RAM.

The third and final switch disables the bank select circuitry. This is done quite simply by driving the *STROBE pin of the 'LS157 high. This forces a low on cutput Y1 bringing in Bank 0. This capability is needed with software that is lazy when writing to the MPU I/O port. A bank switch might inadvertently occur. Further, software which is protected through the use of 'keys' that fit into the cassette port will not load properly without disabling the expansion memory. And of course, because we are using the cassette sense and write lines as our two pseudo-address lines, the datassette is imcompatible with this expansion project.

Circuit theory

Briefly, an 'LS245 bus transceiver buffers A10-A15 to a pair of 'LS32 OR gates acting as address decoders. However, A10 is first AND'ed with a qualifying signal generated by SW1. If the qualifying signal is high (SW1 is open), A10 is reflected at the output of the gate and passed back to the OR gates. If low, A10 is inhibited, and a low is generated regardless of the state of A10.

The OR gates decode the address lines in this fashion: if any line should go high, then a high is generated at the final output. Otherwise, a low is generated indicating an attempt to access memory below $07FF (or $03FF if A10 is considered in the decoding). This signal is labeled *CRAM (Common RAM) on the schematic. *CRAM is then AND'ed with *VID (AEC relabeled). *VID goes low only when the VIC chip updates the display. If *VID is enabled, then both

continued on page 22

continued from page 21

signals must be high in order for the output of the 'LS08 AND gate to be high. When *VID is disabled through opening SW2, *VID is forced high by a 4.7K pull-up resistor. In such a situation, *CRAM is reflected at the output of the AND gate. This output is the BEN (bank enable) signal.

The BEN signal is really the heart of this expansion, P3 and *P4 (P4 is inverted earlier) are each presented to one input of an AND gate; BEN serves as a qualifier at the other input. When BEN is high, P3 and *P4 are present on the output of their respective gates allowing a selected two-bit code to be sent to pin 1 of the 41256 DRAM's. If BEN is low, P3 and *P4 are inhibited and a low is present at the outputs forcing a default to Bank 0. These two outputs are LA16 and LA17.

The two pseudo-address lines are then passed to a 'LS157 multiplexer. The *SELA line of the multiplexer is controlled by the same signal that drives the 'LS257 multiplexors on the system board. That is, the *CAS signal generated by the VIC chip. The two pseudo-addressses are multiplexed onto pin 1 of the 41256's at the same time as the rest of the address bus.

That's pretty much it. Dependent upon the BEN signal, which is enabled only when both *CRAM and AEC are high, four banks of 64K are available. It is worth noting that *VID goes low only on a video access, which itself disables the MPU, and that *CRAM only goes low when the MPU tries to access memory below $0800 or $0400 (depending upon whether A10 is considered).

Installation

The installation of this modification is absolutely a two step process. First, disconnect everything: printers, disk drives, joysticks and the power supply. Next, void your warranty by disassembling your C64. Remove the top RF shield, gently disconnect the keyboard, then remove the screws that hold the system board to the bottom half of the case. Now, remove the bottom RF shield. In some cases, it is held in place by the same screws and simply drops off. However, mine was soldered in place. Desoldering braid did the job for me.

Now life gets interesting. Locate the eight 4164 DRAM's on the system board. They're usually in the lower left corner. On my board they were labeled U9-U12 and U21-U24. Turn your board over and carefully note their position. Now comes the fun part: remove them. I used a combination of solder braid and a vacuum desolder. Each chip should then pry free fairly easily. If you want to save the chips remember to keep your time at each pin to a minimum. The heat generated by a soldering iron will quickly ruin a memory chip.

Once you've removed all eight, install 16-pin sockets and carefully solder them to the system board. Be certain not to leave solder bridges between pins. That's a sure headache later on. Once installed, use a fine gauge wire (I used wire wrap) to link together pin 1 of each socket. For now, connect pin 1 of the last socket to a convenient ground. Install the 41256's. They are extremely static sensitive so ground yourself first to discharge any static that may have built up. Now, reassemble your computer (at least set it back in its case). Reconnect the power supply and your monitor. Hold your breath and turn your machine on.

If you get the usual power on message, everything's fine for now. If you didn't, try reseating the 41256's. Are any upside down? Did a pin slip outside a socket? Carefully reinspect your soldering and try again. If your display flips (i.e. random display that changes in a random fashion), then one chip or more isn't seated properly. Check everything. Most likely, however, you will get the usual power up message.

With the DRAM's in place and working properly, the next step is construction on the mod board. I used point to point soldering, although wire wrap works just fine. If you can etch your own board that's great. For the board itself, I used one from Radio Shack with solder-ringed holes (cat. no. 276-158). Remembering to leave room for ground plane and +5V plane, install the sockets according to the wiring diagram and solder a couple of pins on each socket to hold them in place. Then run the ground and +5V planes. For the planes, try 'stitching' stripped 22 gauge through every fifth or sixth hole and apply a touch of solder. Make the appropriate +5V and ground connections, and install the capacitors at this time. Now, follow the wiring diagram and carefully complete the job. The wiring diagram shows the board from the component side. Remember that pin 1 of the 'LS245 is at the top *left* corner on the component side, and top *right* corner on the solder side.

Just a hint: after I had installed the sockets and power planes, I trimmed the board leaving a 1/4" border all around.

With the board finished, its time to hook it up. but first find a place for it. I have a 64C and placed mine between the VIC chip and the RF modulator. Don't fix it in place yet. Using ribbon cable five-conductor wide, follow the diagram of the Expansion Port on the following page (seen from the solder side) and solder one lead to each address line. I found that ribbon cable from Radio Shack was of a fine enough gauge that I could ease the Expansion Port lead to one side and insert the wire. Again watch out for solder bridges. The address bus will crash, and your computer will lock up with no display.

Determining just how long the cable will have to be is up to you, but keep it as short as possible. Solder the other end of the cable to your mod board, again each lead to one input of the 'LS245 socket.

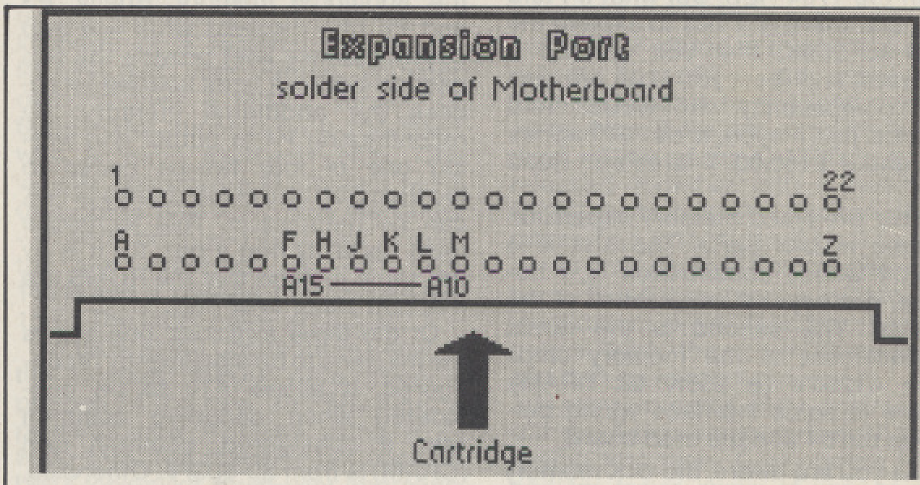


Diagram of the C64's Expansion Port

Now we have to do a little running. Locate pin 1 of either 'LS257 (U13 or U25) on the component side of the system board (look to the right of the 41256's). This is the *CAS signal. Follow the trace away from the chip until you find a silver solder dot. This is a pass-through jumper to the other side of the board. Heat the solder and insert a single strand of ribbon cable about 10" long.

Now locate pin 16 of the VIC chip (U19). This is the AEC signal. Either locate a pass-through jumper as before, or from the solder side, heat the pin, case it aside and insert another single strand of ribbon cable. Now make the appropriate connects to the mod board. AEC goes to SW1, *CAS goes to pin 1 of the 'LS157 multiplexer socket.

Look at the diagram of the Datassette Port. P3 and P4 are available on leads E5 and F6 respectively. P4 connects to pin 1 of the 'LS04 socket; P3 connects to pin 13 of the 'LS08 socket. I also took my power supply from the port. Use a heavier gauge wire to make the connections. Now connect the switches. I found a DIP array works well. Use enough ribbon cable so that you'll be able to pass the DIP switch out the cassette port. This way it'll be easier to get at it when you want to change the configuration of the mem board. Use shrink wrap to insulate the leads of the switch so that casual use doesn't result in two leads shorting to each other.

Don't yet install the chips. Reassemble as much of your computer as necessary and power up. Get the usual message? Great!

If you didn't, recheck your wiring, especially the connections to the expansion port and 'LS245 socket. Since none of the chips have yet been installed, your problem must lie somewhere in the interface wiring. So check it all over and find the fault.

If you have a logic probe, check the A inputs of the 'LS245 socket for high/low pulses. As well, pin 1 should show high and pin 19, low. If missing, check your wiring and the solder joints. Now, test P4 at pin 1 of the 'LS04 socket. Is it high? Do the same for P3 at pin 13 of the 'LS08 socket. It should be low. Check for pulse conditions where AEC and *CAS come to the mod board. Check each ground and +5V connection for the corresponding low or high. If everything checks out, turn off your computer and install the chips ensuring correct orientation and placement.

(Note: all of the above tests can be performed with a volt-meter. High/low pulses will show about 2.4v, low below 0.8V, and high above 3.5V.)

Power up and the usual message should appear. If it doesn't, recheck the above. Also look for pulses on the outputs of the OR and AND gates. Check the wiring of the mod board itself; this is most likely where the problem lies. If the usual message did appear, then turn off your computer and disconnect pin 1 of the 41256's from the ground and connect it to pin 4 of the 'LS157. Power up and you should be in business. Four banks of 64 each are just waiting for you. Reassemble your computer and promise yourself that you'll never take it apart again.

Getting acquainted

Try this from the direct mode with AEC disabled and A10 considered: **poke 1,63**. Your screen filled up with garbage, right? That's because the VIC chip now 'sees' Bank 1 RAM. Clear the screen and enter **list**. Again you probably got garbage or a syntax error. So, enter **sys58303** and then **new**. List again; nothing right? Now enter a short program:

10 for j=1 to 1000; next

Now enter **poke 1,55**. Something happened. The power-up screen (or part of it) is back, and the cursor is about half way down the screen. Now list your program. Not there? Go back to Bank 1 and **list**. It's there, isn't it. Neat stuff, eh?

Now reconfigure bit 4 of the MPU data direction register to output with **poke0, peek(0) or 16**. Now, try going to each of the other banks. For the default power-on configuration, the values are:

bank 0: 55
bank 1: 63
bank 2: 39
bank 3: 47

Have fun with it. Your machine now contains 256K of memory! If you want, enter and run the Memory Test program supplied with this article. It will simply and quickly test the four banks of memory. Also get to know the table of configurations so you won't be too shocked when AEC is enabled, A10 not considered, and you switch banks.

GEOS V 1.3 and 256K

At the beginning of this article, I promised compatibility with GEOS. Using *Configure256*, you can configure a 1541 RAM disk to run under GEOS. The RAM disk uses the bank switched RAM we've just installed. If you've ever tired of what seemed like continuous disk access when running an application, life just got better. Loading an application from the RAM disk takes a second or two; overlays take no time at all. If a copy of the DESKTOP is also on the RAM disk, the DESKTOP comes back up almost instantly.

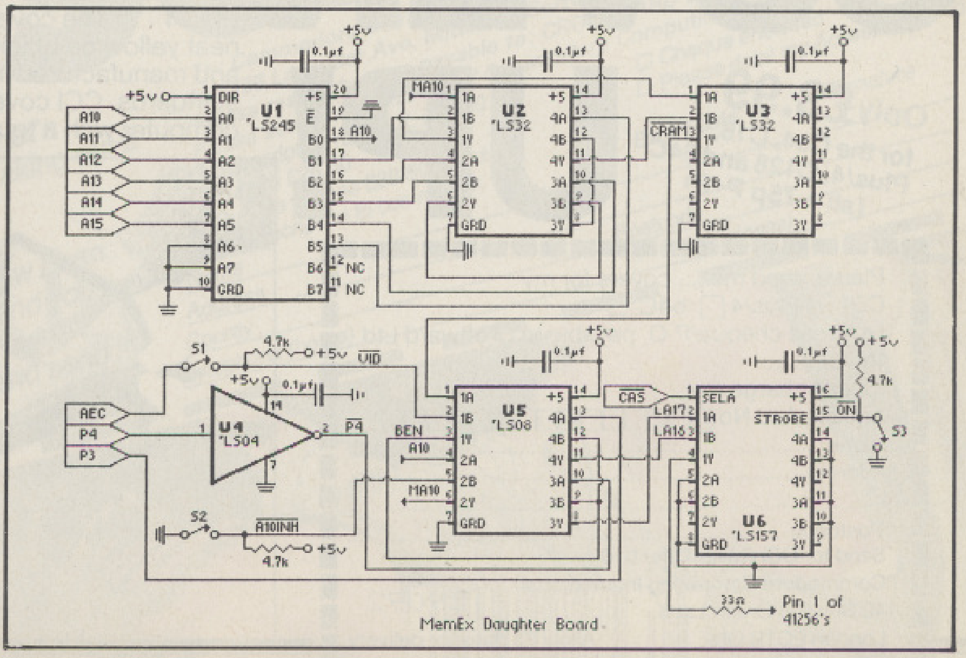
When you first run *Configure256* for the DESKTOP, a small block transfer routine is moved down to $02A7, and the RAM drive code at $9C80 is modified to access the bank switched RAM. Also, the number of drives on the system is stored at $C013. This serves to indicate to the program whether it's been run before and, if it has, to bypasses the above routines.

Next a check is performed to test whether the RAM disk has been formatted. If so, the program exits. If not, it performs a format, then exits. Device 9 is the default RAM drive. On a one-drive system, a new disk icon appears below the other with the name BRAM 1541. On two-drive systems, the icon appears in the same place, but because the DESKTOP can handle only two drives, your second 1541 cannot be accessed.

On subsequent calls to *Configure256*, a menu is displayed offering the following options:

a) **format:** just what it implies
b) **Rdrive A:** move RAM drive to device 8 (only enabled when there are two disk drives on the system)
c) **Rdrive B:** as above
d) **flip:** exchange RAM drive and

continued on page 45



MemEx Daughter Board

The Cloning Of Joanna May

by Fay Weldon (Collins £12.95)

Fay Weldon is usually called a feminist writer because she investigates the 'power struggles' in relationships between men and women. She runs true to form in 'The Cloning Of Joanna May'.

Carl May, ex-husband of Joanna, is a real 'odd bod'. Kept in a kennel as a child, beaten and abused by his mother, who kills herself, and a father who is battered to death in prison, he is eventually fostered out to a loving couple who raise him as their own. He is brainy, business-like and ultimately makes a fortune. On the way up he meets Joanna, daughter of a wealthy doctor, marries her, but insists that they do not have children, pleading his own unhappy childhood as an excuse.

But, unknown to Joanna, while they were married Carl, who owns — amongst other things — a clinic, has had his wife cloned. (Principally, it seems, so that when Joanna is old he knows he will at least have four younger versions of his beautiful wife to play around with, for Carl, like many a menopausal man before him, has a penchant for young women).

During an apparent termination of a pregnancy one of Joanna's egg cells was extracted, taken to a laboratory also owned by Carl, and divided into four. The resulting embryos were implanted into four women desperate to have babies. Not strictly cloning but parthenogenesis plus implantation. Thus, unknown to Joanna, there are four more of her, albeit thirty years younger, walking around somewhere, for Joanna is sixty, and divorced by Carl, before she discovers what happened.

Naturally, it is a shock for any women to find that she has had quads without even knowing it, although Joanna seems to think of the clones more as sisters than as children, but she really should not have been surprised at anything Carl did for he was obviously crazy from the start. And who wouldn't be with his history?

If Joanna found life with Carl hard to take, life without him is even harder. For although he has divorced her, Carl — dog-in-the-manger that he is — cannot let her go or bear to see her happy and every time she takes a lover Carl has him (accidentally) killed. It is obvious that the tycoon still has ambivalent feelings for his ex-wife and she for him.

Joanna, not in the past a strong personality, uncovers hidden strengths in herself as she sets out to find the clones. They, in turn, are looking for each other and finally for Joanna, too.

Jane, Julie, Gina and Alice, the clones, are alike in looks but utterly unlike each other in their characters and, when they finally get together, with their mother/sister, Joanna, Carl inevitably gets his comeuppance. And in a very nasty way.

It seems that Fay Weldon has never before written science fiction. Although one of her previous novels, 'The Life and Loves of a She-Devil' (which was turned into an award winning T.V. serial) bordered on the fantasy genre, it was not quite SF. Similarly, then I'm also not sure if this book can strictly be classed as SF even though it does have many of the ingredients that go to make up a science fiction story.

'The Cloning of Joanna May' is not a comfortable book to read for Fay Weldon has an idiosyncratic style of writing that can sometimes become irritating. In addition none of the characters are particularly sympathetic except, perhaps, Bethany, Carl's bimbo girl friend.

Nevertheless, the ability to make one keep turning the pages just to find out what happens is the test of a real writer. Fay Weldon certainly has that ability.

D.M.

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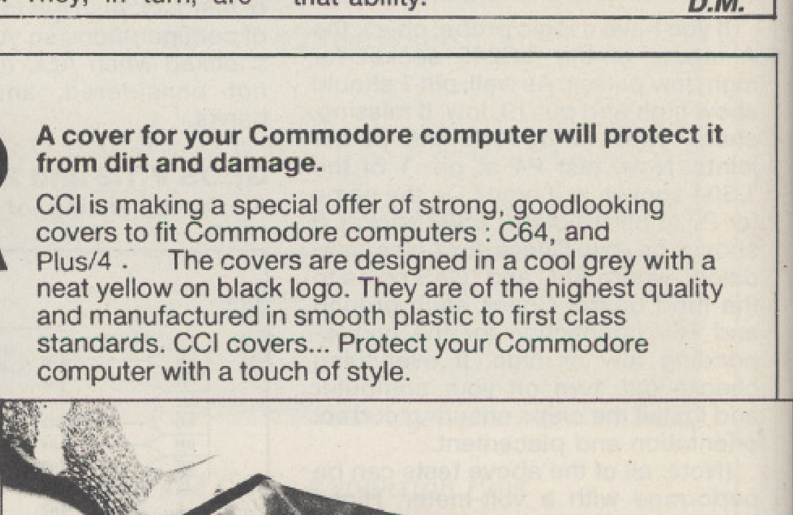

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The Future of Computer Sound

Kati Hamza reports on the fascinating developments in computer voice synthesis and recognition

Dateline: 2056
Location: Earth

The owner of a nice little solar-powered bungalow somewhere in Stepney returns home after a hard day's work at the satellite factory. Outside it's sweltering - the tarmac's melting on the streets. She steps into the hallway, and immediately advises her home computer to switch the air conditioning on. The computer performs this task, asks her if she's had a nice day and relays any telephone ,messages she might have had. As the evening progresses, the computer adjusts room temperature, puts on the dinner, switches on the CD player and discusses the menu for next week's meals - all at the prompt of a verbal command. There's no need for QWERTY. Nowadays everyone controls their PC by voice.

If there's one thing most science fiction movies, from the classic 2001 to the latest Star Trek, have in common, it's the conviction that by the 23rd century talking to our computers (and being understood) will become as commonplace as using the visiphone and the holographic CD player - both of which the self-respecting home-owner is bound to have as well. After all, it's only logical. Why chain yourself to a keyboard and restrict yourself to typing rate of 150wpm (at the most) when you could be giving commands at a rate of up to 250 wpm, using your hands to perform some other task at the same time and moving around the room as well?

But is all this science-fiction ever likely to become science fact? Research into aspects of speech technology has been taking place since the 1950s. It's currently being applied to an increasing number of specialist commercial and business uses. However, the problems of simulating the full-scale speech process that we see depicted in Star Trek, for example, are immense.

All communciation, down to the most basic interchange, can be divided into two separate acts: the production of sounds by the speaker and the comprehension of what those sounds mean by the listener. Computer technology simulates these by means of speech synthesis and speech recognition.

Speech Synthesis

Human voice production is a complex process. Each spoken word is shaped by the lips and throat and given impetus by the power of the lungs. Synthetic speech has to attempt to translate digitized computer data into exactly the same form. There are two main ways to approach the problem. The first involves attempting to model the actual motions of the articulators by feeding the computer with a number of parameters representing their positions: eg. the lip opening, movement of the tongue tip and so on. The most obvious advantage of this system is that the realistic sound of the speech produced. On the minus side, there's an immense amount of data involved and the process tends to be complex and costly.

A more common approach is to feed the computer with the basic phonetic rules of a given language. Usually, this involves breaking the language down into sound units. Phonemes - groups of sounds identified as variants on a single sound in any one language - and their contextual variations allophones, are among the most suitable because there are only 40-60 different phonemes and 100-200 allophones in the English language. Compare that with 10,000 syllables and you realise just how useful a phoneme can be!

In response to strings of text input, an algorithm connects the sound units into words or sentences and the result is synthesised speech. Its main advantage is a practically unlimited vocabulary. As the synthesiser processes units of sound rather than individual words, it can vocalize anything from lists of complicated numbers, to Shakespeare to gibberish - whatever the user decides to input.

Clearly quantity of output is no problem here. Quality is a different matter. Firstly, though most synthesisers speak clearly enough to be easily understood, voice output still tends to sound unnatural, mechanical and robotic. In the English language different words may be emphasised differently according to their position in the sentence. A simple word like 'had' for example, varies in length and intonation according to context. Compare 'he most certainly had' with 'had you?'. Generally speaking, a synthesiser isn't capable of that kind of complex subtlety. For short term use that doesn't really matter, but if user and system are to spend long hours together, Star Trek style, the monotonous tone can become irritating. According to some social researchers, in a business or manufacturing situation, long term usage of a more primitive system could increase stress factors, thereby, it would impair the efficiency it's actually trying to promote.

Secondly, although a synthesiser can vocalize practically anything, it will not necessarily get the pronounciation exactly right. The more complex the demands you make on the system, the more likely it is to make mistakes such as the mispronounciation of irregular words, proper nouns or words adopted from a foreign language. Obviously, different systems vary in quality but greater sophistication demands more complex algorithms and greater memory space — both of which tend to significantly increase the price.

Speech Recognition

Speech recognition works the opposite way to synthesis: analogue speech is translated into digital electric form and matched with templates stored in the computer's memory. A voice recognition database may be constructed using a number of different sets of linguistic information: the acoustic patterns of phonemes;

speech patterns such as the relationship between pitch of voice and size of the vocal tract; or, the contextual change in pronounciation of words according to the environment in which they're spoken. In order to recognise all the phrases, words or phonemes (for which the sound unit size depends on the complexity of the system), they need to be fed into the system to create the templates before such a system can operate.

Obviously, a Scot, a Welshman and a Londoner all using the same recognition system are unlikely to pronounce the same words in exactly the same tone, pitch or dialect. As a result most voice recognition systems tend to be speaker dependent - the machine has to be taught to recognise the voice and vocabulary of each potential user in turn. As this involves each user speaking each word into the machine several times, initial implementation takes time, patience and a reasonable amount of technical knowhow. Anyone who purchases a speech recognition package can be sure of one thing - they won't be chatting to it straight away.

That is only one drawback. Most recognition systems have a small vocabulary. Digitally stored words use up large sections of memory, therefore, the amount with which your system can cope depends on the amount of memory your computer has available. And whilst memory expansion may help a little, it can also slow the processing speed to an inefficient rate.

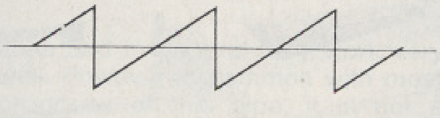
The main problem, however, is accuracy. Just think about how many different ways it is possible to emphasise a simple word like 'hello'. Your voice might convey any number of emotions - anything from pleasure, through sarcasm and indifference, to hysterical shock. The intonation alters the acoustic pattern of the word itself. Any similar alteration in a word a system has been taught to recognise means that it may fail to register.

> ***"Even when a user has trained a machine to recognise his or her voice, there is room for inaccuracy."***

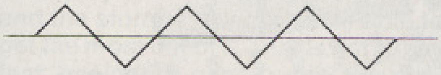
Even when a user has trained a machine to recognise his or her voice, there is room for inaccuracy. A speaker may be nervous at a first encounter with the machine but become more relaxed as he becomes accustomed to using it. In a pressure situation he may speak faster and raise his voice. Because the speech patterns are not exactly the same, the accuracy of the system is reduced.

Waveforms

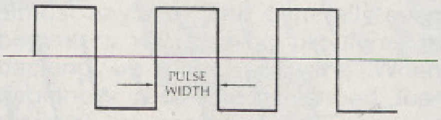
Computers interpret sounds in terms of high frequency and low frequency POKE and DATA statements. These statements consist of a series of numbers that the computer can put into certain memory locations to form a particular sound, which are then later interpreted as note values or frequencies. In turn, the number statements correspond to a wavelength pattern. Examples of the four different types of waveforms that can be generated in a C64 program are shown below (Source: Commodore 64 Graphics and Sounds, by Timothy Orr Knight, Howard W. Sams & Co., Inc., 1984).



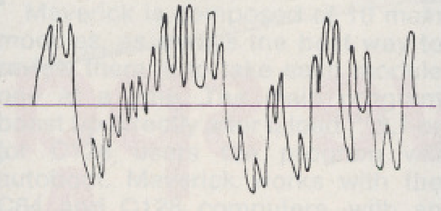
(A) Sawtooth.



(B) Triangular.



(C) Variable pulse width.



(D) White noise.

Signal distortion may cause even more difficulties. Background noise and reverberation, the distortion of the acoustic pattern by reflections from walls or furniture, can contribute to inaccuracy (though if the interference is constant, it can be measured and compensated for). A high fidelity microphone attached to a boom for consistency is one answer, but there may be more problems if the microphone needs to be changed. Even the transducer for converting acoustic signals into electric ones may introduce its own distortion.

Ironically though, the major stumbling block to accurate language recognition has to be the language itself. Successful communication between two human beings draws on a vast pool of shared contextual knowledge. We know from the context and experience of what the words usually mean that when someone speaks of a sovereign's reign, for example, they're very unlikely to be talking about a coin on a horse or a certain type of storm named after a king. A voice recognition system, on the other hand, has no means of distinguishing the word reign from the words rein or rain; consequently, the possibility all sorts of confusion to occur is great.

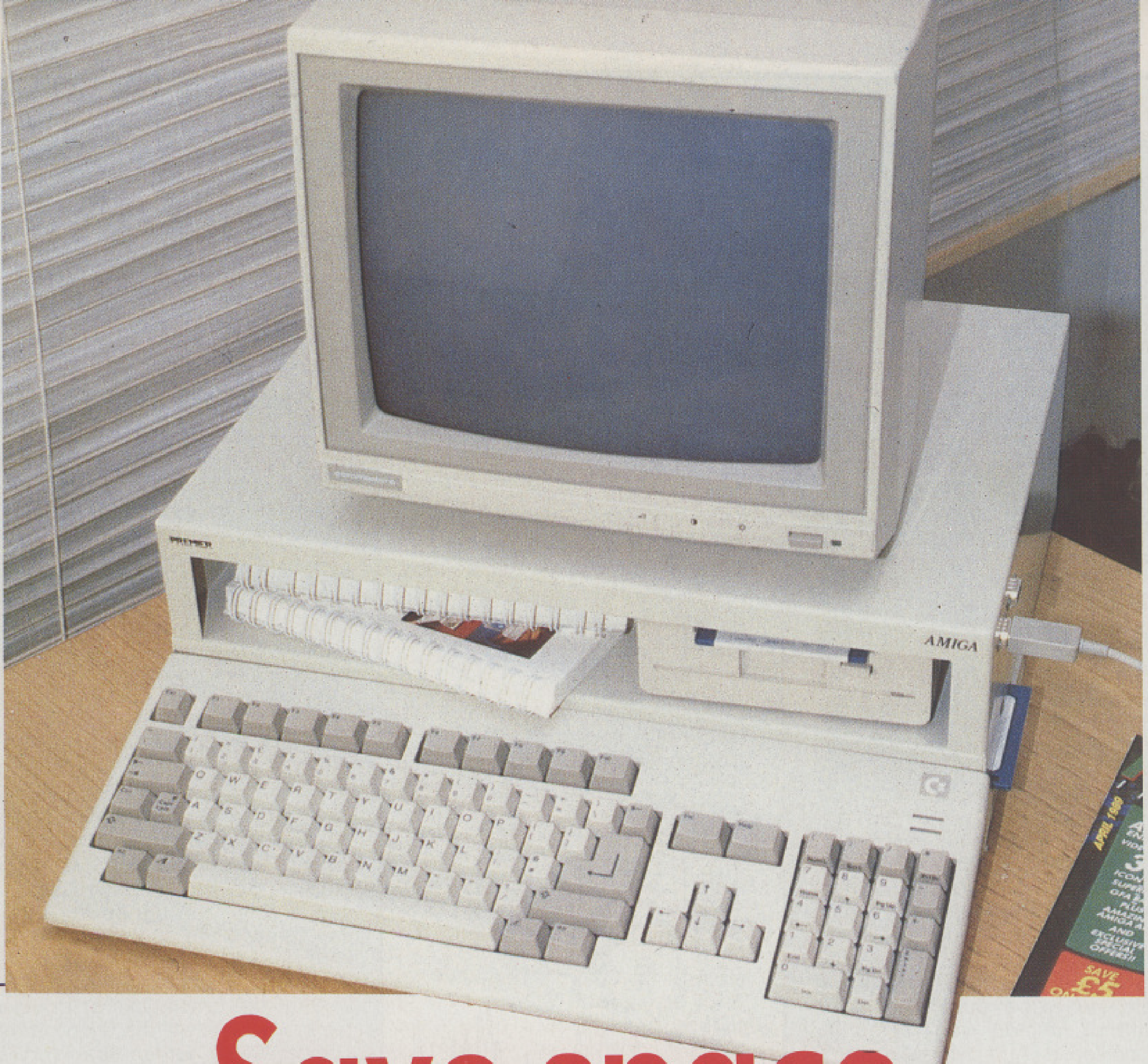
In addition to the homophones complicating the recognition process, vowel pronounciations often overlap. Words like top and tap can start to become indistinguishable. Worse still, normal speech doesn't necessarily pause at word endings; that means unless you have contextual information (which the computer doesn't) phrases like 'ice cream' and 'I scream' sound exactly the same. More basic recognition systems actually require you to leave a gap between each spoken word for clarity - something hardly designed to encourage natural speech.

Ambiguity is another difficulty. Anyone who has ever played a text adventure game will be familiar with having to phrase commands in a form the program can understand. Input like 'give Bert the dog' is usually too ambiguous to be acceptable. To make sure the computer knows exactly who the subject of the sentence is, the form 'give the dog to Bert' is less problematic.

What the drawbacks of both systems illustrate is the extraordinary complexity of human speech. Computers can perform all sorts of incredibly sophisticated calculations far faster and more accurately than any human being, but when it comes to communicating intelligible, comprehensible sound and translating it into thought, human anatomy wins hands down.

Speech comes so easily to most of us, we hardly ever think about the vast amount of data processing going on in our brains. Every act of communication we make draws on all the contextual knowledge we've experienced so far. We're able to make allowances for different dialects and accents without too much concentration and most important of all, we have an almost infinite capacity to learn. When you consider all that processing power working in combination with the tonal subtleties the larynx, lips and tongue are capable of expressing (not to mention all the frequencies that the ear is sensitive to), the kind of synthetic communication we see portrayed in so many movies starts looking like an extraordinarily difficult task.

Next month, Kati Hamza continues her investigation into computer sound by exploring the latest developments in voice technology systems.



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The Maverick V3

Illegal copies or legitimate back-ups? Andy Eskelson reviews one program that keeps that line super fine.

One of the most emotive subjects at the moment is that of software piracy. There are several groups that feel that any form of copying should be outlawed, there are others that feel that any form of copy protection is morally illegal. As far as I can see these two views are mutually exclusive, and will never be resolved, especially if you take the middle view and consider the problems that software protection brings.

Protection seems to aimed at the home market; major computer systems have very expensive software, yet rarely employ software protection. Maverick is a collection of backup utilities that are all linked together by a master menu. Aimed at the professional end of the home market, it is one of those products that could be used in illegal pirating.

The aim of protection is to maximize the profits of the software company. This means that software is hard to copy, and should act as a deterrent to the commercial pirate.The aim of the user is to maintain a reliable system, taking into account any software corruption that might happen; subsequently, backups of application software are vital.

This brings us onto the subject of program backup tools. Any sensible user will want to make backups of his software (it is also drummed into the head of every software programmer/ system manager that you MUST take backups). Before I go on to describe the functions of the Maverick I will quote a couple of lines from the handbook, which say it all about ripping-off software: *"Let's talk straight with each other. If you've purchased this program, you're a valued customer. If you haven't, you're a thief...."* I think that that says all that is necessary on the subject.

Maverick revealed

There are dozens of functions available, and in general they work very well. However in common with most programs of this type, it is not a beginner's tool. It requires a lot of familiarity with the computer system and the storage devices to be able to get the most out of it. That is not to say that beginners cannot use the system, it is designed to be used by almost anybody, and generally even beginners will find no problems in backing up most software. When beginners read the advanced features of the program, they may get lost very quickly.

Maverick is composed of 10 main modules, as always the best way to review them is to take each module one at a time. The main program boost up directly after a load '*',8,1 or for C128 users the program will autoboot. Maverick works with the C64 and C128 computers, with an assortment of disk drives: 1541, 1541C 1541 II 1571 and the quick file module also supports the 1581.

Fast Data Copiers

These are used to back up non protected disks, (ie your own programming efforts). You do TAKE backups don't you ?? They also work as a first stage tool when unprotecting a disk.This module supports two modes of operation, single or dual drive. You are presented with a short menu requesting you to select single or dual before the main module is loaded.

A very nice feature that has been added to the V3 package for C128 users is the support of Video RAM expansion. Maverick will make use of this extra RAM to reduce the number of disk swaps when using a single drive. Another feature for C128 and C64 users is that the Ram Expansion Units 1764 and 1750 are supported. This enables ONE pass copies, and duplicate copies to be made. In addition, the main menu of this option allows you to software setup your drive device numbers if you have not hard wired them.

GCR Nybble Copier

There are two common methods of storing data onto a floppy disk. One is MFM (Modified Frequency Modulation) and the other is GCR (Group Code Recording). In the early days of the PET, Commodore produced their first disk drive. They chose to use GCR format, as it offered a greater storage capacity at the time. Commodore have continued to use GCR through all of its disk drives, and with the new 1570/71 series of drives, MFM has been implemented as an extra feature.

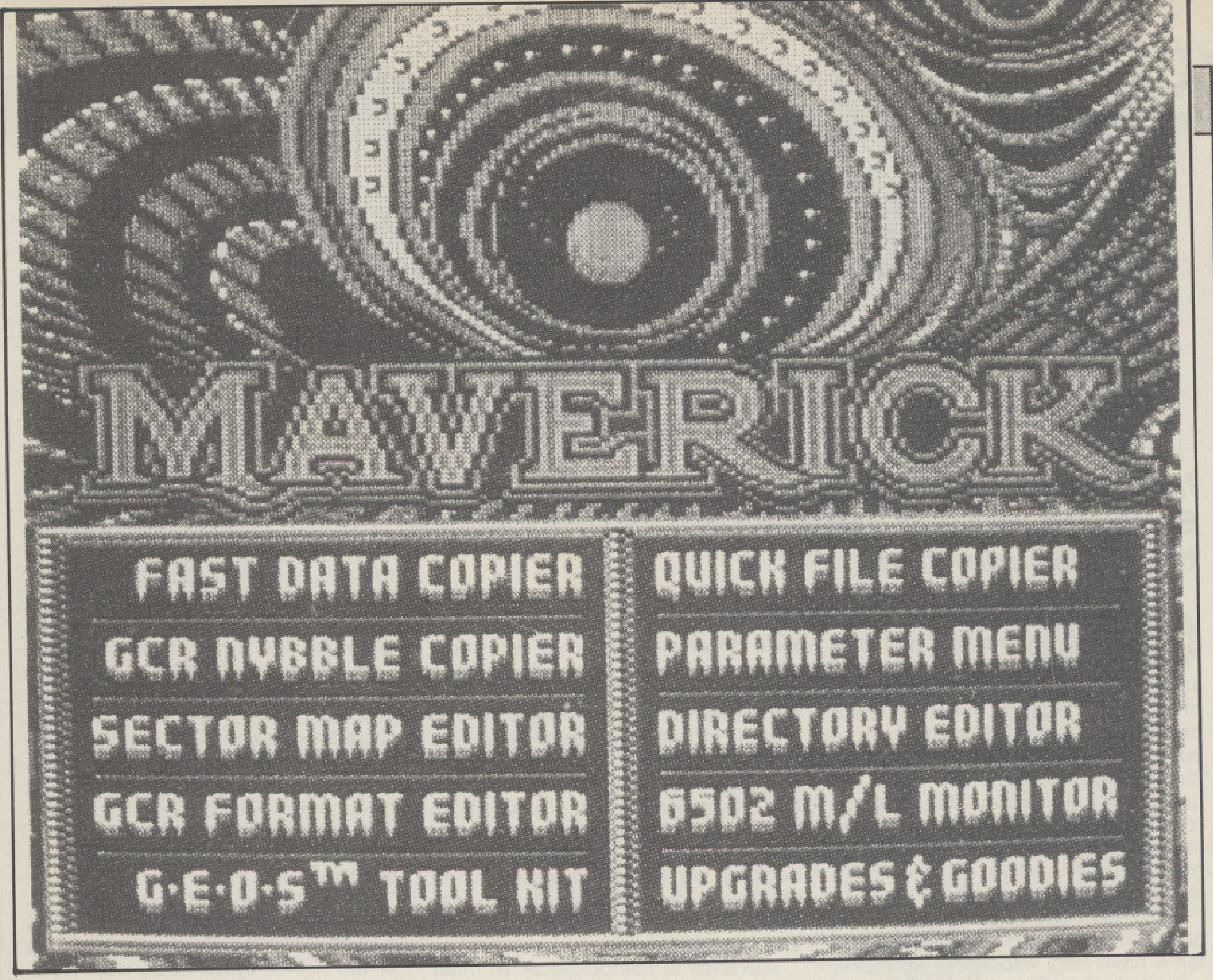
The GCR Nybble Copier will overcome most of the older protection systems and will also work with a lot of the newer systems as well. However it is not infallible and it will not copy some types of protection systems. The GCR copier is able to reproduce all of the standard disk errors. You can select the start and ending tracks for the copy, read the directory, and also copy 1571 disks, (in a 1571 drive of course).

Sector Map Editor

This module is deceptivly simple, and also very dangerous! it allows you to edit the disk sectors directly and this means that you can very easily ruin a disk. SO ONLY WORK WITH BACKUPS until you are sure of what you are doing. The module can scan the disk to find the used sectors. You can view sectors in hex/Ascii and also disassemble any code that you find. Printers are supported so it is easy to get a printout at any time.

GCR Sector editor

This editor is very very powerful, as it works at the lowest level of the disk, directly in GCR format! You can select bit rates, create tracks examine syncs, and all sorts of other parameters. You have full disassembly modes available, help screens hex/ascii display, notepad (allows you to save one header while looking at another) Load and save headers and much more. It would be possible to fill a complete magazine with a



discussion on the operation of GCR and its use on CBM disks. This is a very powerful module.

GEOS Tool Kit

This module is for users of the GEOS system of tools. It allows you to backup all of the GEOS modules. Also in the module is a sector editor that runs under geos, and a GEOS file copier. There is one other utility that will allow you to install all of the GEOS utilities onto the 1581 disk drive. There is even a GEOS parameter selection that is used to create working versions of the applications once you have copied the original disk with the single drive fast copier.

Quick File Copier

This is a very useful utility; in fact it is the one that I now use in preference to the DOS shell on the 128. It allows you to copy files from one disk to another. Full subdirectory support of the 1583 is available, and also you can vary the skew settings of the file when you re-save it. This setting determines what the interval between sectors on the disk are, which allows the computer time to process the information from a sector. Ideally you should arrange for the next sector in the sequence to come under the head just as the computer needs it. If the skew is too short, you will have to wait for a whole revolution of the disk before the sector next comes under the head. This can slow down loading times dramatically. Both video ram and Ram expansion units are supported with this module.

Parameter menu

This is what Maverick is all about. For each piece of software that the normal nybbler cannot copy there is a parameter (providing that the authors have produced a parameter for it). You get something like 400 parameters with the package, so you stand a fair chance of finding what you want. You simply scroll down the list until you find the parameter that you want and then look at the instructions. You are told what copier to use first. All you normally need to do is to make a backup of the program disk with the nominated copier, and then load and run the parameter associated with that application. The Parameter module will then prompt you to put the backup disk into the drive and it will then write onto the disk the necessary changes to make the disk run as normal.

Some copy protection systems need the use of hardware to overcome them. If you have the 8k DOS ram expansion then you can make use of it with some of the parameters. This also has a drive speed setting routine as it is sometimes require to change the speed of the drive in order to produce a working copy of the program.

Directory Editor

This module is another very useful one, as it allows you to sort the directory and place dividers into it. This may sound a little silly but it does make finding programs very easy especially if one particular program has several sub files included in it, a divider can make the directory much more readable.

You may also edit the disk name, the disk ID and of course the file name as well. This also supports the file lock feature that will help prevent the erasure of the file.

6502 M/L monitor

This does not sound very exciting, and in general it is a fairly standard monitor but it does have a very interesting feature or two. It is completely relocatable, which means you can create a version that will load into any area of memory. There is also a command that will switch you into the disk drive memory. Remember that Commodore drives are small computers in their own right, so it is perfectly feasible to edit the memory in the drives and also to run programs within the drive as well.

cont. on next page

Upgrades and Goodies

This module contains a few utilities that will make your life a little easier..

Data Scanner

This is a very fast disk scanner; it will look for a string of data that you input. Enter the search data as hex dec or ascii and up to two lines in length. The data scanner then asks for the start and end tracks and it will then go off and search the disk for the data. Once the data has been found, you can go to that sector and have a close look at it in hex/ascii as well as a disassembly listing. Jumping to the next sector in the link is supported as well as rewriting] the sector after modification.

Directory Recovery

This is a last resort utility, if you header a disk, without putting a new ID on the disk, the original data is normally left intact, and with a lot of effort it can be recovered. This program will trundel through the disk looking for all the various links in the sector maps and also in the directory structure. It is not fast, in fact it can take over an hour of processing to recover a disk! If you do not have a backup (shame on you !) then this utility could get you out of trouble.

Sector Editor

This is a comprehensive sector editor that will allow you to look and and modify disks. You can allocate and deallocate sectors, scan links, help screens, ascii/hex/disassembly displays. All in all a very powerful disk editor.

Relative File Copier

Not much to say about this, except that it is one of the very few rel file copiers that I have ever seen. If you are into database programming you will know just how useful this routine is.

REU Quick Test

The ram expansion unit should be checked every so often especially if it has been unplugged at any time. The Commodore test is fine, but it takes ages to run. This test takes only a fewseconds and will indicate that the REU is ok. It is not as comprehensive as the Commodore test, but something has to be changed to get the speed. If you still suspect that you have problems with your REU then this test used in conjunction with the Commodore one will help you identify where it has gone wrong. This test indicates what chip and in which bank has gone wrong.

Conclusion

Maverick is the most powerful utility package that I have ever seen, of that I have no doubt at all. It is not something that I would recommend to the first time commodore user, but even so there are parts of Maverick that a beginner can use with ease. The instructions are clearly set out, and describe the operation of each module very clearly. Upgrades are available to registered users every few months and there is a promise of expanding the GEOS utilities even more. Anybody needing to delve into the Commodore disk system will find that Maverick provides the tools for the job. A VERY VERY impressive piece of programming by the Authors.

A.E.

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Apple's source for your chips...

Mark Smiddy shares some personal opinions on yet another computer crime wave - source code kidnapping

Earlier this year, stories began to circulate in the US that a group calling themselves the "nuPrometheus League," had stolen the source code of the Apple Macintosh ROMs. In support of this claim, the group apparently sent letters to US journalists and developers containing a disk with a small section of source code on it, plus instructions for anyone interested to place an advert in certain Macintosh-oriented publications. Other sources claim that portions of the code also popped up on the on-line service, Compuserve - a similar system to the UK's Microlink.

It is an interesting sideline to notice the group's choice of name in "nuPrometheus." In literal terms the word, nu, is just the 13th letter of the Greek alphabet - however in this case I would suppose those concerned are using it as a cliched version of the phonetic spelling of the English, new.

More importantly though, in Greek mythology Prometheus was the Titan who stole fire from Mount Olympus to give to man. As a punishment for this heinous crime, the gods chained him to a rock and let an eagle tear out his liver. Prometheus was spared from continuing his fate when Hercules came to his rescue.

It is almost needless to mention, no manufacturer in their right mind would ever attempt to plagiarise even a small portion of Mac's ROM code. If they did, the herculean might of Apple's lawyers would descend on them like the hammer of the gods - et tu Brute?

Apple's only real worry is perhaps, in the hands of some unscrupulous developer, the entire source code could be an aid to developing a version of the Mac ROMs that would not breach any international copyrights. This is highly unlikely though, Apple's protectiveness of their WIMP environment leads them to openly threaten developers of any system which looks even remotely similar.

A typical case of this currently hiding behind the scenes concerns the so-called Macintosh Emulators like Spectre and Aladin for Atari's ST and new addition to the fold, A-Max for our beloved Amiga. Apple will not supply the ROMs required to run these systems to anyone except registered Mac owners - they are available through grey imports in spite of this. Also, I understand Apple have a dispute with ProficomP (producers of Aladin) since they modified part of the Mac's memory resident operating system - Finder- which could possibly constitute breach of copyright.

All this leads me to believe Apple have very little to worry about. Apart from uniquely friendly design of the environment itself, there is, as far as I am aware little or nothing special about the code running it.

The most interesting question arising from this is how did nuPrometheus get hold of the source code in the first place?

There are two possible answers to this: the press reports have got it wrong and are referring to disassembled object code - after being misinformed by nuPrometheus; or someone - probably inside Apple - has pinched the source code. This would amount to little less than industrial espionage; something which carries a very high penalty in the west. For this reason I expect the former to be more likely, since nuPrometheus seem to have done all this for a prank. They can gain very little benefit from it.

A final, admittedly outlandish possibility, was that the group hacked into Apple's central computer and downloaded the source from there! Of course, such systems do not exist at the end of a telephone line - do they?

One report on this story concludes with a quote from the league which states their main intention to pass "the genius of a few Apple employees into the hands of the rest of the world." Like Prometheus, they see themselves as distributing the property of the chosen few to the rest of the world. Unlike the titan, who gave fire to benefit mankind, few people can gain anything by the group's action - except gain some notoriety for themselves.

Where then does this leave other manufacturers like Commodore who have their own 16-bit baby in the form of the Amiga? This raises another question: how did Commodore - like many others - manage to copy the IBM PC? Surely this amounts to copying everything but the source code. Surprisingly IBM do not consider the ROM entry points or the design overview their "intellectual copyright." So while the actual ROM code and PCB layouts are protected by IBM clout, their form and functions, are not - leaving the clone marketeers having a field day.

In effect, the end result depends very much on the manufacturer concerned. If Commodore were to adopt a similar attitude to IBM with the Amiga ROMs, then in time we could start seeing cheap Amiga clones. In the current climate however, this seems unlikely - the Amiga is based on a clump of custom chips - like a Ferrari. PCs, on the other hand - like most other cars - are based on existing tried and trusted technology so copying them is relatively easy.

M.S.

Getting Back On Top

US Gold was once the unquestioned leader of the UK entertainment software industry. Now others are rising to challenge. CCI went to US Gold's Birmingham headquarters to find out how it was planning to get back on top.

"The huge risk we take means we've got to get it right." says Roger Swindells, US Gold's Group Product Manager. He is referring to the big ticket investment that has to be made to bring out any really major game these days.

For a start, any potential chart-topping game has to be programmed across nine formats. "Five or six years ago," comments Swindells, "We used to work just for the C64 and the Spectrum. Now we've got to go for the Amstrad, the Amiga, the ST, PC, Sega, Nintendo and even the Apple Mac."

Roger Swindells outside USG headquarters

Part of the "huge risk" for US Gold may mean the cost of a licence for an important film like Indiana Jones or a coin-op such as Thunderblade which can be around the £100,000 mark. If the cost of the development, which it can easily do, comes to about another £100,000 and you throw in a further 20 or 30 thousand for marketing, advertising etc, you have to pull in some 1/4 million pounds before you hit a profit. So a software company like US Gold certinly does have to "get it right" or face a horrendous loss.

But Geoff Brown, US Gold's big boss, has been getting it right for long time in computer industry terms. He started the US Gold story in the early eighties and, in the reception area of US Gold's smartly furnished offices on an attractive Birmingham trading estate, among the many awards the company has received over the years, framed on the wall is the receipt for the first sales the company made on January 3rd 1983.

Geoff Brown, ex-teacher and budding rock musician, had crossed the Atlantic and knocked on the doors of the most successful U.S. software companies and persuaded them to let him take their games back into the then virtually unknown U.K. market. With his wife, Anne, he then built US Gold and Centresoft, now the U.K.'s leading software distributor, into a powerhouse of international fame and local profit.

> ***"For a long time US Gold was the automatic Number One in the UK and consequently in Europe too."***

For a long time US Gold was the automatic Number One in the UK and consequently in Europe too. Nothing, though, least of all the world of computing remains unchanging. USG has, like all entertainment companies, a hard fight to retain its position in a fast evolving market. And certainly challengers have now arrived on the scene where once USG was the top dog.

Is the Champion Over the Hill?

The most notable competitor for the premier position in the UK is a closely-associated company, Ocean. With Robocop, Operation Wolf and other recent successes, Ocean has pushed US Gold into second place in UK sales.

Robert Maxwell's Mirrorsoft has emerged the leader in the 16 Bit chart toppers. Microprose, once an affiliated label of US Gold, has leapt to prominence on its own and swallowed up Telecomsoft's Firebird and Rainbird labels and it has moved away from its traditional simulations into popular hits like Microprose Soccer. Even Activision probably pushed USG's big release last Christmas, Thunderblade, into third place in the charts with its R-Type.

To add to the strength outside, US Gold's management may have been weakened by the loss of its well-liked Operations Director, Tim Chaney, who has left to run a business for himself.

Does this mean that the once mighty US Gold will descend to the second rank of software houses. Will the Gold labels no longer glitter with that special megastar quality? Is the erswhile Champion over the hill?

Round Two

No, not according to Geoff Brown. The departure of Tim Chaney, who was involved at a day-to-day level seems to have galvanised Brown back into

continued on page 34

continued from page 33

feverish action. In the month before *CCI* interviewed him, the US Gold boss had flown across the Atlantic and back three times, including visiting the Las Vegas Consumer Electronics Show - "the best for us yet" - discussing business in New York and meeting with a software development house in Vancouver on the west coast of Canada.

"I am now a hands-on policy maker."He explains. "Strategy orientated...I always knew what was going on but it was third hand...but now there are so many opportunities... We can still do innovative things..."

> ***"Certainly the giant has not been sleeping."***

Certainly the giant has not been sleeping. USG has introduced some "innovative" ideas. Last year it launched Kixx, a budget label.

"Everybody said we'd fail..." says Brown with a somewhat grim satisfaction. He is commenting on the fact that practically singlehanded US Gold shifted up the price of quality budgets from £1.99 to £2.99, which no-one can deny is excellent value for games such as World Games from Epyx, Metrocross, 720 and the ever-popular Leaderboard. Already in the top three budget labels, with Codemasters and Alternative, Kixx will, Geoff Brown predicts confidently "sell a million!".

US Gold has launched a label that is really a budget level for 16 Bits. "Classics" sells at £9.99 and has such older titles as Outrun. They even tried a midprice range for 16 Bit originals at £14.95.

The US Gold boss admits that it was 'an experiment' and not a very succesful one." We've never lowered our prices before... It's hard on the man in the street but you need the £19.99... before you know it you are down the road to £250,000 cost including the guarantee for the licence... We're driven by financial reality. We've seen," he goes on reflectively,"a lot of software houses come and go..."

This midprice setback has not pushed US Gold off course, Brown maintains. They are carefully considering a £5 price point for 8 Bit games. They will not reveal which games will appear at this level "But they won't be originals.. .I don't know how Codemasters makes a profit..." says Brown flatly.

The 8 Bit market is still good for US Gold. It does over 50% of its business there and the C64 is its best machine. "The 8 Bit just will not die!" states Brown.

US Gold's business always was but now is even more international. Over 40% of US Gold's turnover is done outside the UK, largely in Europe. "The way deals are structured these days, you need those areas... It used to be just the icing on the cake. Now it is the cake!"

This brings Geoff Brown to the obviously tender point of whether US Gold is still "Number One". "Every business goes through some kind of a hiatus when you stop, you change, you re-structure..."

He declares that there is only one company in the UK that has the muscle to challenge US Gold and that is Ocean. There are cross shareholdings between the two." It's nice that it's either them or us but it doesn't matter whether we are Number One or Number Two in the UK charts, our big growth has been in Europe..." There, in that bigger market, Brown insists, US Gold is still on top.

But though Geoff Brown may say that it does not matter who is number one in the UK charts, and even though its place might have been usurped by only its very friendly associate Ocean, US Gold's founder and boss gives the impression he is unwilling to concede the long-held leadership of the UK entertainment software industry without fighting for it. "No," he shakes his head determindly," Now it is round two..."

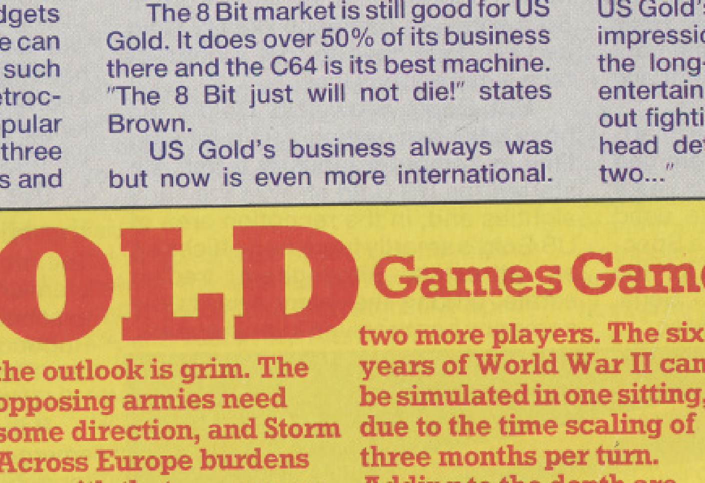
US GOLD

Games Games Games Gam

Along with a few contenders for that all-important Christmas number one spot, US Gold have a wide ranging selection of games to tide us over in the meantime. A trio from SSI, including the next in the AD+D series, should keep the strategists quiet. On the coin-op side, Black Tiger and the current arcade favourite, Strider, are both on the way via the bulk Capcom deal. Epyx are working on the Amiga version of The Games: Summer Edition, while another of Gold's US connections, Lucasfilm Games, has opened the door to the tie-in with Indiana Jones and the Last Crusade.

Storm Across Europe

Europe is under attack from the Nazi forces, and the outlook is grim. The opposing armies need some direction, and Storm Across Europe burdens you with that awsome responsibility. Units of tanks, paratroops, infantry, air support and mechanised back-up are under your control, with the optional additions of two more players. The six years of World War II can be simulated in one sitting, due to the time scaling of three months per turn. Adding to the depth are the inclusions of multiple scenarios, varying starting levels for each country, and a computer to control the Allies, Russia or both.

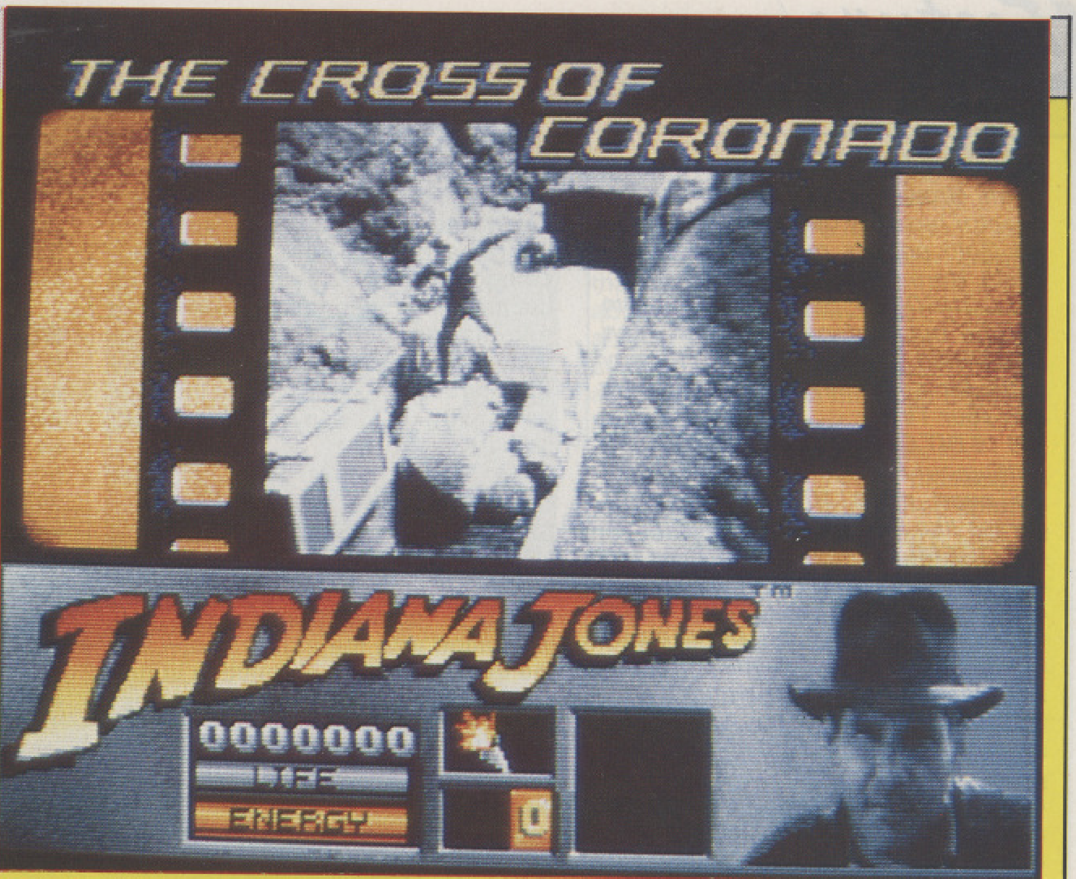


Curse of the Azure Bonds

So you found the Pool of Radiance and saved the city of Phlan. The following trip to Tilverton would make a pleasantly uneventful interlude, or would it? You awake in Tilverton feeling as if your brain had been put through a mangle. Worse still, five azure-blue symbols have appeared under the skin of your right arm. These bonds periodically glow, assuming total control over their host. Despite the efforts of your best clerics and wizards, they stay put. What are they? Who put them there? How can their curse be lifted? You set out into the Forgotten Realms to get some answers.

Red Lightning

Once again, Russia play the bad guys in this US-



originated wargame. East-West relations have hit rock-bottom, and World War II has broken out. Play either as the Soviets, battling against NATO forces in your quest to capture the Ruhr, or as the NATO commander repelling the attack. SSI claim Red Lighting accounts for every vehicle and aircraft in the war!

The Games: Summer Edition

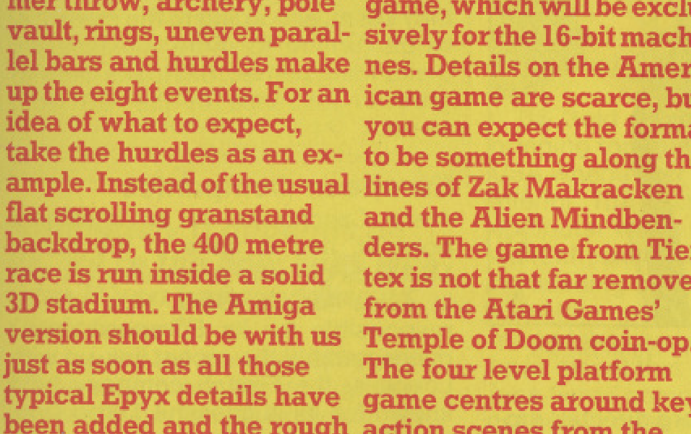
Seventh in the Epyx Games series, The Games: Summer Edition combines a few new events with some old faves. The 64 version was commended for it new approaches to each event, some of which have been taken a step further in the game's move up to 16 bits. Springboard diving, velodrome cycling, hammer throw, archery, pole vault, rings, uneven parallel bars and hurdles make up the eight events. For an idea of what to expect, take the hurdles as an example. Instead of the usual flat scrolling granstand backdrop, the 400 metre race is run inside a solid 3D stadium. The Amiga version should be with us just as soon as all those typical Epyx details have been added and the rough edges removed.

Indiana Jones and the Last Crusade

Two games are in the pipeline; Tiertex are programming the "arcade" game across the major 8 and 16-bit formats, while Lucasfilm Games are taking care of the adventure game, which will be exclusively for the 16-bit machines. Details on the American game are scarce, but you can expect the format to be something along the lines of Zak Makracken and the Alien Mindbenders. The game from Tiertex is not that far removed from the Atari Games' Temple of Doom coin-op. The four level platform game centres around key action scenes from the film, leading up the the traps and puzzles guarding the grail itself.

Black Tiger

Black Tiger never stunned the masses when it hit the arcades, and has dated rather quicker than Capcom would have aimed for, but is a very likeable little game all the same. The coin-op's graphics have been re-drawn in minute detail, so accurately in fact that they may as well be direct ports from the original! The bad news is that the programmer has had to put the project on ice while he is working on another, more urgent piece.



Strider

Strider

Capcom are currently back at the top of the arcade chart with Strider, a brilliant '89 update on the platform theme. Strider, the hero, is a cross between a bionic commando and Spiderman. The angular wildnerness and cities are no problem for this flexible gymnast, who leaps, swings and shins his way up, over and around all-manner of constructions. The land and cityscapes, bristling with enemies waiting to be hacked to pieces, scroll in all directions, in perfectly smooth parallax of course, which should give US Gold's programmers a thing or two to think about! Strider will definitely be a tough one to convert, but with a bit of effort, US Gold could have one of the best ever coin-op tie-ins on their hands.

Last Crusade: The Movie

What could top the discovery of the Ark of the Covenant? How about unearthing the Holy Grail? When Indy's dad goes missing during an attempt to track down the grail, the whip wielding adventurer puts himself on the case. It turns out that the Nazi bignobs were using Jones Senior to lead them to the grail, wanted for its eternal life-giving powers.

Sounds familiar? The plot of The Last Crusade does tend not to stray too far from that of the first adventure. The menace of the Nazis is stronger, so the tension is stepped up, but you always know the next wise-crack is just around the corner. All the stunts and special effects you would expect have been packed in, although the cuts from stuntman to star are blatantly obvious at times. With a smidgeon of imagination to glaze over the joins, The Last Crusade is a good bit of fun.

continued on page 36

continued from page 35

BROWN ON GOLD

Geoff Brown, US Gold's managing director has very definite opinions on US Gold and its relationship to the world. Here are a few of them.

***ON CONSOLES:** Sega will sell well in Europe but Nintendo and that Atari Hand-Held ... who's going to pay £150 for something you can't plug into your TV?*

***ON 16 BIT GAMES:** We do very well in putting our 8 bit games on 16 bit. But we need more 16 bit product ... games like Populous are brilliant!*

***ON GREMLIN** (now buying itself out of the "Gold" empire): I owned the company and Ian Steward did all the work. It's having a personality change, with more serious products. People ask "what happened to it?" But it's been doing very well even if it's not been apparent through the gallup charts ...*

***ON CENTRESOFT** (the Brown owned software distribution organisation): I try not to get too involved. I keep it at arm's length. I don't take a day-to-day active interest. It wouldn't be fair ...*

***ON BEING A SOFTWARE PUBLISHER:** I still start at eight o'clock and finish at seven. And I work weekends ... I spend 95% of my time on US Gold. The difference between success and failure is very small ... two or three per cent ... It's not easy being a software publisher ...*

***ON COMMODORE:** Why don't they make the 64 into a games console? If they asked me to find it, I'd be able to make a case for it ... Nintendo and Sega are limited by the software cost ... You can't be successful without software support as Nintendo proved ... with a 3 1/2" drive and the amount of software that already exists on the 64 it could be the most successful ...*

Making It Happen

It has been said that nothing happens until somebody sells something. US Gold have taken that idea to heart and built, in a comparatively small industry, possibly the biggest marketing organisation of any games company. Allied to whatever advantages its close association with the Centresoft distribution network, its marketing strength makes it a formidable competitor for any other company attempting to push games onto your screen. US Gold's team is headed by a group marketing manager, Roger Swindells, who has been in the industry for over five years working with companies like Melbourne House. His job is to control the marketing of every product that US Gold releases, whether or not it comes from US Gold itself or one of the many companies like Epyx or Loriciels which US Gold represents.

Those products these days are all games, for US Gold, although it did at the beginning, no longer has any involvement with "serious" software. Its releases are divided into four categories: U.S. Licences, such as Lucasfilms' Indiana Jones, etc, SSI's role-playing games, European associates, and, arcade licences, notably Capcom. Each category is the responsibility of a separate product manager.

U.S. Licences

Sue Baker is responsible for dealing with the U.S. Companies day-to-day arranging for everything from packaging to competition run in collaboration with the magazines — like the Indiana Jones competition in this ***CCI***. Indiana Jones is her big project at the moment — though by the time you start playing it, she will probably have become involved with something else ...

Anne Brown, director and Geoff Brown, chairman

The Steven Spielberg directed movie, starring Harrison Ford and Sean Connery is just hitting the screens, around the world and in the USA, and is already taking more at the box office than its two film predecessors. US Gold released a not terribly successful Indiana Jones game before. The latest movie-based computer production is a joint venture between Lucasfilms, the film studio owned by George Lucas, creator of the Legendary Star Wars series and US Gold. Lucasfilms are producing an adventure game and US Gold an action platform game (see US Gold Games To Come box).

Sue Baker's also in charge of making it happen for the games of other US companies such as Epyx. Their 'Games, Summer Edition' is due out on the Amiga shortly and the old favourite california games is to appear on the KIXX budget label.

US Gold's original success was from US games houses and it still has a closer relationship with companies on that side of the Atlantic then any other European games company, which also has the advantage of giving it easy access to the US market by releasing its own created games through its American associates.

SSI

Bob Mallin is dedicated to role-playing. That is not just a description of his job at US Gold where he works exclusively on the games of SSI, the long-established American company which is generally regarded as the world's leading software role-playing software house. Mallin is clearly fanatical about role-playing games, personally as well as professionally. The growth of SSI in Europe in recent months — "Phenomenal!" Mallin calls it — has trebled sales of its games. This has turned what once was a very small cult into a major sector of the computer games market leading to specially-dedicated magazines like G.M.

Over the next five years, SSI is planning to release some 20 titles. As the first and second genertion of computer games players get older they seem, according to the statistics, to be turning to more intellectually demanding games; SSI looks likely to grow in influence in the US Gold world.

European Companies

Alexa Czechowski is an intelligent polyglot, and in spite of the name, Midlands girl who previously worked in sales for US Gold. Now she is responsible for its European associates notably the recent link-up with Loriciels, the French company best known for its successful Turbo Cup, and Topsoft from Spain. Alexa views both these companies as underrated by British gameplayers. She sees other European companies, particularly those from France and Germany as likely to grow in public attention in the UK and elsewhere and increasing their importance to US Gold's share of the total games market.

Coin-Ops

US Gold's major successes in the last few years have largely come from its financial muscle which has made it able to pay, for computer companies, huge sums of money to acquire highly successful arcade licences. Outrun, still probably the biggest selling title ever in the UK was typical of this. Big coin-op titles already have a reputation with arcade players so a computer game can cash in on that.

This area in US Gold is the responsibility of Andrew Chorzelski. He points out that arcade games are

continued on page 37

increasingly complex: "What we try to do is take a game for machine that has many different capabilities and much greater power and capture the flavour of the original across five or more formats. A nigh on impossible task ..." he admits ruefully.

Some coin-op companies spend literally millions on developing dedicated super chips for their arcade machine with a power equal to 10 PCB's. "It's a question of compromise," says the US Gold coin-op product manager. "From the Spectrum at one end to the Amiga at the other ... you convert it ... but something's got to give ..."

US Gold's main advantage in coin-ops is its contract with Capcom which guarantees it a flow of big name arcade hits. It is already planning its output for Spring 1990. Earlier than that, you will be seeing such successes as Strider, and the sequel to Ghosts and Goblins, Ghouls and Ghosts.

Interestingly, the major market for home computer games in Europe, West Germany, is not as great for coin-op conversions. Because no-one under 18 years of age is allowed into public arcades there. The problem of the German market is one among many that Andrew Chozelski has to solve for as he says, "Arcade games don't market themselves".

"Ultimately it depends on us. We're the only ones who care if you have a game at Christmas!"

As we moved attempting fly-on-the-wall invisibility through the pleasantly-furnished, American style offices of US Gold, we were impressed by the normality of the atmosphere, the professional expertise obviously being employed, even the number of ties being worn. It could have been any international marketing company.

Many software games houses look like computer players' bedrooms without the sleeping equipment — and sometimes even with that.

This company looked businesslike. Except for the monitors on which little sprites jumped and fell under the playtesters fingers, this could have been any commercial organisation. While that may not sound very exciting to your average arcade games player, it is surely one of US Gold's strengths. Its commercial professionalism gives it the backing to generate the cash that enables it to buy big licences, to employ top development teams and to market its games so that they get to the players in big numbers, so generating more cash to start the whole process again at a higher technical, and they hope, playability level. And without doubt, its fraternal association with Centresoft, the UK's top games distributor must enhance its market penetration too.

Susan Baker and Andrew Chorzelski

Nevertheless, what really matters, in the home computer games work is not just highly-competent organisation and carefully martialled marketing; it is fundamentally the magic of a game itself.

US Gold created its reputation by bringing top quality games from the USA when other software was inferior. The changes in the computer world since Geoff Brown went knocking on American doors persuading software houses there to let him open up for them the UK market they were hardly aware of have meant that US Gold has now to face fierce competition with games not solely created by someone else but by US Gold's own resources. That task is not an easy one. The creativity, the brilliance of concept and execution that make a hit game are not simple to find, use or control. The programming teams who work from 10 at night till 5 a.m. are murder for properly run companies to manage. They may however be exactly the people who really can make the hits, because their bending or breaking the rules of "normal" life may be a facet of the way breathtaking, original ideas that every games player wants to experience and every other programmer hurries to copy.

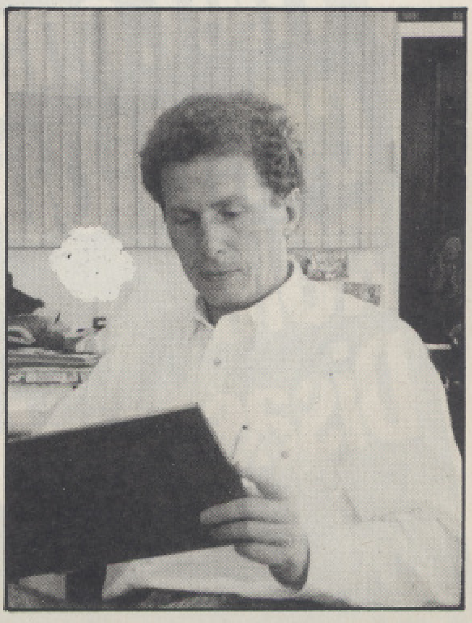
The dominating position that US Gold once held in the UK market has been eroded all round the probably usurped by Ocean. US Gold sees titles like "Indiana Jones and the Last Crusade" as the way back to the top spot. However, these days, A "title", big though it may be is not enough. Especially in the 16 bit arena, quality counts; the full-price buyer is becoming more and more discriminating and demanding. If US Gold is to recapture its predominant position, it has to go all out to create that quality, in graphics, sound, and above all in gameplay. Once it was able to supply games of that standard from its American associates. Now, in the main it will have to do it for itself.

Perhaps coming releases like "Indiana Jones" will put it back on top. There is very determined spirit noticable at its headquarters. Like all organisations they have their conflicts and clashes. In the games testing area, where we loitered, we hoped unnoticed, a dispute was taking place about what should be done over some problem in a game. It was the eternal division between the creative urge for excellence and the commercial need to get something into the marketplace.

A senior person on the development side was putting his point to a marketing man. "Ultimately," he said heatedly, "we're the only ones who care if you have a game at Christmas!"

It was clear that though the development people did care if US Gold had a game to sell at Christmas, what most concerned them was that it should be a game that not only would be bought but that would be worth buying and playing.

It is probably that determination, that dedication to quality which, more than all the big titles US Gold can buy and powerfully market, that could really push Geoff Brown's US Gold back where it used to be — unrivalled and on top. It will be up to you, the games players and games buyers, to decide if that's where you think US Gold should be.



More 64 Power

Are you ready to 'move on' from your C64? Peter Gerrard ponders the implications ...

Presumably most of you reading this series of articles already own 64s, either bought or given by generous friends or relatives. Why did you get the 64 in the first place? A question that is probably easily answered by considering how long you've owned the beast, because the 64 has been around for more years than some of us care to remember. Approximately seven years, in fact, which in home computer terms is a very long time indeed. And, as if you needed reminding, it is still going strong.

When it first appeared in these shores there was a very straightforward choice of BBC, Spectrum, or Commodore 64. There were other computers about of course, and apologies if I've offended any Dragon, Oric, Lynx, Jupiter Ace etc, fans, but the real choice was between those three machines. The Vic was being phased out, and quite right too. A marvel at the time, but how do you word process on a 22 column screen? People tried, of course, and there were some ingenious programs, but 22 columns was not enough. One or two long words and you were on to the next screen line, which isn't a very healthy state of affairs.

Consider, for a moment, how software development has been affected by the width and height of the computer screen. Early Scott Adams' adventures (you knew I'd mention adventures, didn't you?) could get away with room descriptions like "You are standing outside a ramshackle old building. A path leads away to the west," because on a 22 column screen it looked like quite a lot of information. Put it on a screen that was almost twice as wide (e.g. the 64) and a palty description like that was lost at the top of the screen. Games clearly had to expand with the screen, so we moved to 32 columns on the Spectrum, 40 on the Commodore 64, or 40/80 on the BBC. Interesting how, to some extent, the computer screen dimensions dictated the way that programs would develop, be they adventure games or word processors.

Clearly you know why you bought a 64, just as much as I know why I did.

Peter Gerrard Kevin Bergin
The Complete
COMMODORE 64
ROM
Disassembly

The very thought of even attempting to word process on the dead flesh of the Spectrum keyboard was just a joke, and the BBC machine was far more expensive than the 64, even though the 64 seven years ago was priced at roughly two and a half times its current price, £349, I think, was the price of my first Commodore 64, and that was without tape deck and free software and mice and things bundled in with it. That was just the 64 itself.

So, for whatever reason, the 64 entered your household and was proudly displayed before the rest of the family, most of whom probably disowned it and lost all interest. I speak from experience! One of the cats pressed a few keys occasionally, but that was that. A basic 64 setup consists of the machine, a tape deck, and some software. From there, provided that money is available, one would like to expand and move on to greater things. Which way to go?

A disk drive is the obvious first purchase, but there are plenty to choose from. If a super-fast drive works with the software that you want to use and is advertised as compatible, then why not use it? If you are buying it for use with a specific program, though, do make sure that it runs with that program. Commodore's own selection of drives would certainly be all right, but they are so dreadfully slow in comparison. Significantly faster than cassette, of course, but much slower than other drives. Speed is not everything, I might add, and there is a lot to be said for reliability, but there are impatient souls amongst us who do hate waiting what seems like weeks for anything to happen.

> ***"I regularly communicate with an 84 year old priest who is just starting to come to terms with Basic programming. Tremendous!"***

There are software and hardware ways of speeding up the existing Commodore drives, which all adds to the expense I suppose, but at least these ways are available to us if you buy the Commodore drive first on the grounds of keeping things in the family. If you can't afford a disk drive at all, though, then it's back to the humble tape deck and seeing what can be done from there.

Learning Aids

The best thing that you can do with a computer, I think, is to teach yourself how to use it, and judging by the correspondence I get then an awful lot of people are trying to do just that. A lot of these people are of the senior citizen variety, and I regularly communicate with an 84 year old priest who is just starting to come to terms with Basic programming. Tremendous! But, tape deck or disk drive, where do you start?

I do not know if it is still available, but the most successful tutorial we ever published in my days at Commodore was something called Strathclyde Basic. The tape and accompanying manual, which was huge, sold in enormous quantities and obviously hit the right spot as far as many people were concerned. There was another, tape only product, called Basic Basic, but that never did quite so well. Possibly the difference might have been that Strathclyde Basic did have that manual, and it was written in this country as opposed to the American approach of Basic Basic. Whatever the reason, it was a superb introduction to Basic and if you are trying to learn and are really only just beginning then it might be worth looking around to see if you can find a copy. There are two parts to it, as I recall, which followed on nicely from one to the other, and you could do a lot worse.

There are many books on the subject as well, including my own efforts, and computing books can be picked up very cheaply if you're prepared to hunt around and search diligently. You can also spend a fortune getting books from the States if you want, and if you can afford to do that than I'm sure you can also afford to buy a disk drive! These things cost money.

Whether you learn anything from the books is a different matter. I received a letter this morning from a beginner who was reading a book about another computer, which had a small listing on it. This listing had a variable name of STACK in it, and now knowing the perils my letter writer used the same variable name. The Commodore 64 doesn't mind variable names of more than two letters, but it will only respond to the first two, which in this case would be ST. Those two letters are a no-no as far as the 64 goes, being one of the reserved Basic words. ST deals with peripherals like the tape deck, and gives us a clue to their status (and hence ST), and tampering with it produces some weird and not so wonderful results. My letter writer didn't know this, and you can't blame the author of the book because he/she was writing about a different computer. The point is not to rush out and buy a "teaching yourself" book just because it's cheap. Who knows what unforeseen errors might occur?

Programming

If books and tutorial tapes are not your cup of tea, then there are always listings in magazines such as this one, and one of the great and traditional ways of learning to program is by looking at other people's programs and seeing how they have put things together. Once you have a master copy safely stored away on tape or disk then you can tinker with the original to your heart's content, and hopefully teach yourself a few things in the process. I taught myself how to write adventure games by combining listings from three different sources.

I would alter a variable or a piece of data to change a jewelled sword into a jewelled dagger (we've all got to start somewhere!), and by gradually changing and indeed inter-changing

cont. on next page

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Harwood Computers	15, 19
Hindley Electronics	Magenta Pages
Homebased Business	Magenta Pages
Insight Software	Magenta Pages
ICPUG	31
Jem Distribution	41
MCE Services	Magenta Pages
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pieces of the three programs I ended up with something that was uniquely mine. I felt inordinately proud, as well, and was determined to go on and teach myself more and more about programming. Copying the manual and bouncing a little ball up and down the screen was all very well, but I wanted to move on from that and do something slightly more interesting.

The great thing to remember about experimenting with other people's programs is that you are not going to cause any permanent harm to your computer, at least, nothing that can't be cured by switching it off and on again. Things may temporarily cease to work, but they'll soon be all right again.

One of the areas of experimenting that seems to cause problems is with those two familiar commands PEEK and POKE. PEEK won't do any harm, since you are only taking a peek at a section of memory, a case of what the programmer saw, but POKEing around indiscriminately can easily lead the computer astray. This is only to be expected, there are after all over sixty five thousand memory locations in the 64 that can be reached with the POKE command. You cannot alter all of them, but some of the ones that you can change play a very delicate role in the continuing existence of the 64. Locations 0 and 1, for example. I must stress that you will not do your 64 any permanent harm, and playing about with other people's programs is still one of the best ways to learn how to program yourself, but if you POKE the 64 at random and it gets a fit of the sulks, then don't blame me!

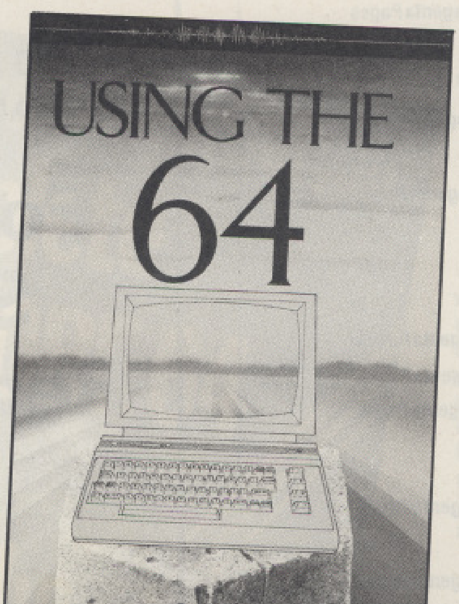
So there are many ways of moving on from the basic 64 in terms of teaching yourself to program, or perhaps teaching young child who prefers to spend his sessions on the computer in a reign of terror on unsuspecting aliens. No wonder we don't see so many flying saucers these days, they've watched computer screens and seen the future! There are many ways of getting a child interested in programming (most of them seen interested anyway), but as I'm not a child psychologist then I'll leave that up to you.

"Apart from programming, what other avenues are there?"

Apart from programming, what other avenues are there? Software provides many routes, although sometimes that software can be difficult to obtain. Not impossible, though, seek and ye shall find. There's no great reason for getting a "better" word processor, if you're happy with the one you've got, and for a word processor to be of any great and lasting use you would have to move on in the hardware field as well.

SPRITES & SOUND ON THE COMMODORE 64
Peter Gerrard

This brings us to printers, having already looked at disk drives earlier on. There are thousands of printers that are capable of running with a 64, and it all depends on your budget and what you want to do with the printer. Writing letters and printing out listings requires nothing more than a dot matrix printer, and those can be found quite cheaply if, as usual, you are prepared to do some hunting around. You might also need to buy a suitable interface as well, which would unfortunately add to the cost, but again there are sometimes bargains to be found. The end result will probably be a thousand and one wires trailing about all over the place and a strong need to keep all things computing confined to one room, but as long as it works that is the main thing.



Daisy wheel printers, apart from being more expensive (usually) allow you to move on to better quality type, at significantly slower speeds. I've never owned a daisy wheel printer and at present can think of no reason why I ever will, since dot matrix ones nowadays allow you something very near to typewriter quality output, and being as versatile as they are you can easily switch from typewriter quality to graphics and listings modes very easily. There must be a market for daisy wheels, people keep making them, but I don't think that you average 64 user would benefit from having one at the moment.

You could always go absolutely mad and buy a laser printer, but if you can afford one of those then you're a better man than I. I think we can safely leave laser printers out of things, as far as the average 64 user goes.

"I have been programming for over ten years on mainframes and home computers and I still only consider myself a beginner at the art."

And the ultimate "move" would be to buy a new computer, but why? If you're happy with the one that you've got, then there is absolutely no need to get another one just because Mr. and Mrs. Jones up the road have got one. Few, if any, of us will ever know everything there is to know about our present computer, there is always something else to learn, some other way of doing something. I have been programming for over ten years on mainframes and home computers and I still only consider myself a beginner at the art. Or is that science? As long as you're content with the 64, and I certainly am, there is no need to get anything else if you can't really afford it. Be honest, and carry on learning about the one that you've got. Next month, hopefully, we'll learn a bit more about our old friend the Commodore 64. Bye for now.

P.G.

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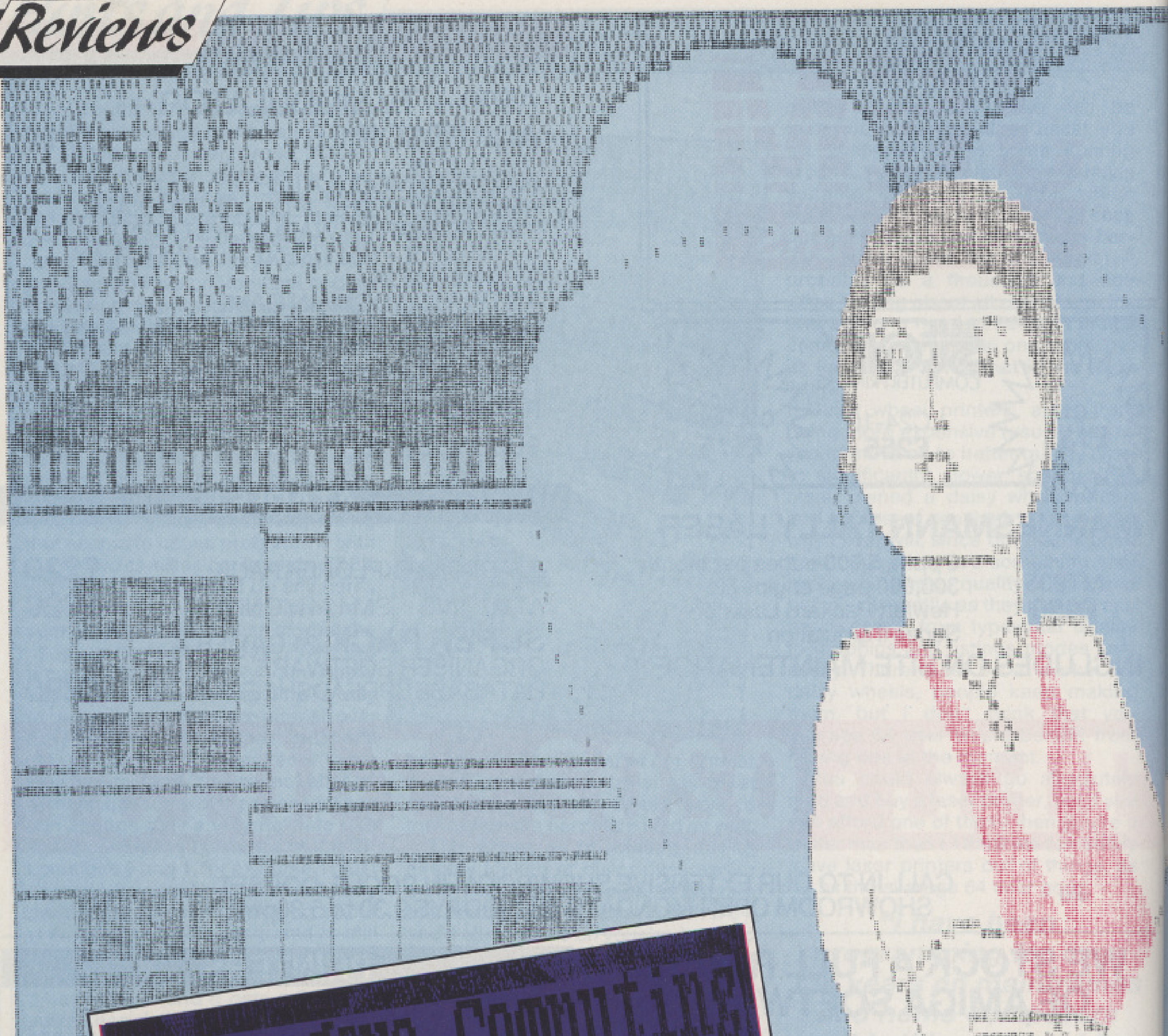
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POSTER MAKER 128

If you have a message to get over, get it over in a great big way. Using his C128 Bob Collyer helps you to get posted with this clever little utility.

Free Spirit Software, suppliers of many home productivity programs, have developed yet another to add to their ever increasing library of utilities.

Poster Maker 128 allows you to create extremely large posters with sizes ranging from the smallest, which is 396mm wide by 338mm deep, up to the largest which is 990mm wide by 845mm deep. With a hard copy print out involving 25 A4 size pages, it is big enough to draw anyone's attention!

The program was written by Dave Krohne, who has been responsible for developing many programs using the Basic 8 system. I am sure that by now all C128 owners are familiar with this system, which is devoted to the full 640x200 pixel hi-resolution display in 80 column mode. At this stage I must explain that you will require a 128D or a standard C128 with the 64K video RAM chip update installed. Another requirement is the use of a 1351 mouse. Additional software needed are any Basic 8 picture files in 640x200 format. Colour pictures will work with Poster Maker but some problems occur where bitmapped background colours look odd in the monochrome printed result; black and white pictures always work best.

If you have these requirements then the rest is simple. This disk based program is self booting and completely menu driven. To create a poster, first insert a disk with a picture file on it which was created using the Basic 8 system. A list of all pictures is displayed from which you can choose the one required to enlarge to poster size.

Ranging from 2x2 to 5x5 enlargements, the picture you have selected will then be analyzed by the program, all 128,000 pixels of it will be divided up into smaller individual 'page' size pictures depending upon the scale of enlargement. These 'pages' are saved as files, which can each be recalled and edited if reloaded into your particular graphic art program, and then resaved. This sometimes becomes necessary where you want an important area of your picture to contain a lot of fine detail.

What the program does is to magnify the original to whatever size, therefore the individual pixel size is also magnified; this creates a rather blocky result. However, the whole poster is not supposed to be viewed close up, but from a distance thus making the finished poster more acceptable. It takes quite a while for the program to convert the whole picture, even the smaller posters take quite a few minutes, giving you time to make a cup of tea and get the glue and scissors ready for later.

The next menu is automatically presented when the magnification process is complete. You now have a disk with a poster files ready for printing. Supposing that will be the next step it is just a matter of pointing and clicking on the 'print poster' option. There are several popular dot matrix printers and interface combinations supported, all you have to do is follow the simple prompts regarding your particular setup and then save to program disk. The configuration is then automatically loaded up every time.

During the printing you are asked to re-align the paper after each page. I must say that this utility is a great consumer of printer ribbons. You'll need more ribbons than the local gymkhana organiser! If you are good at wallpapering at home then the task of cutting and sticking the page size print outs together will be easy. If you're not then be careful, it is easy to cut yourself to ribbons and super glue all your fingers together!

As you will probably be an existing owner of another Basic 8 utility, there are a couple of other things that Poster Maker will allow you to do. For example, you can enlarge brush files from your other programs and reduce picture files to brush size files.

This product will be just the thing for a club, school, local organisation or anyone needing to make professional looking posters. If you're not any of these it is still nice to have your pictures enlarged so that they can be stuck up on your wall in pride of place for all to see!

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1541 at the device number. On a system with two drives, this allows you to have three drives available (through only two at a time).

e) **1541:** remove RAM drive from system.

f) **quit**

The menu appears immediately to the right of the DESKTOP menu.

There are some points to note while using this patch. The first is that A10 must be set to 'considered' and for estetic reasons, AEC must be enabled (video display drawn from Bank 0). The RAM disk table uses RAM from $0400 to $FFFF in BAnks 1-3. If A10 is not considered, the Bank 0 RAM at $0400 will be overwritten, leading to a *System Error Near ...* message.

Next, this program, and in fact, this expansion module is incompatible with the Calculator DA. The DA writes to $01 in a very sloppy manner causing an inadvertent bank switch. If you use the Calculator, switch off the mod board. It can be done on the fly, so you can switch it back on afterward.

GEOS must be run from Bank 0, GEOS writes to $01, and knows nothing about our Ram Expander. If you *do* manage to boot, and run *Configure256*, you will get an error message. Shut down and reboot from Bank 0. Otherwise, you're only asking for trouble.

Lastly, there is absolutely no such thing as free memory under GEOS. This program has been tested with applications like *geoWrite 2.0, geoCalc, geoPublisher*, the *geoProgrammer* package, the *Desk Pack* and found to be compatible. However, I cannot guarantee compatibility with applications not listed.

There are also some limitations when running this program under GEOS. *Configure256* does not support the shadow drive, nor the Stash, Fetch, Swap and Verify routines. If you run the *Configure256* program from your boot disk, it will indicate a 1541 RAM Drive, but RAM expansion will be "none." Don't attempt to configure a shadow drive. If you do, rerun *Configure256* and click on "Rdrive B."

How to get there from here

A question I kept asking myself throughout this project: where do I go from here? It's been 11 months since I modified my C64 to run with 256K, and I'm still coming up with new ideas and uses for my expansion memory. Here are a few of the more interesting ones. About 1.8K of the Kernal is devoted to cassette operations; how about replacing that code with stash and fetch routines? That way precious CRAM is not cluttered with transfer routines. Or how about a modified CHRGET routine to fetch BASIC text from another bank?

You've got nearly 196K of expansion RAM. How many graphic screens is that? Easy animation?

Or something more down to earth: a few days ago, I was working on a problem that required a sector editor, an ML monitor and a couple of other support utilities. If I hadn't had the expansion RAM, I would have been loading one, using it, loading another, using it and so ad infinitum. As it was, I loaded each into its own bank and switched banks when I needed to.

Here's something on the hardware front. On the C128, you can declare 32K of CRAM through the MMU. How about adding another AND gate and switch (along the lines of the A10 inhibit circuitry), and declaring more CRAM. Or add A9 to the address decoding. When A9 considered, CRAM would only go to $01FF. Each bank could have its own BASIC and OS vectors. Four computers in one!

I leave it up to your capable hands and imagination.

Table of configurations

A) The four banks:

Bank 0: 55
Bank 1: 63
Bank 2: 39
Bank 3: 47

Bit 4 of the MPU DDR must be set to ouput (=1). By default, bit 4 is set to input and pulled high by a resistor. For this reason, bit 4 is inverted at the mod board.

B) Three switches offer 'hardset' configurations that can be switched on the fly:

i) **A10 consider:** considered when open

ii) **AEC enabled:** enabled when open

iii) **Disable Mod:** disabled when open.

a) A10 considered/AEC enabled: CRAM $02-$03FF. Video display data drawn from Bank 0, however OS 'sees' current bank. Therefore, screen seems to freeze until Bank 0 reset. Type blindly: **poke1,55.**

b) A10 considered/AEC disabled: CRAM $02-$03FF. Video display is drawn from the current bank, OS also sees this bank, and updates accordingly.

c) A10 not considered/AEC enabled: CRAM $02-$07FF. Default screen matrix now falls within CRAM. All banks share a common screen.

d) A10 not considered/AEC disabled: CRAM $02-$07IF. Reverse of configuration (a). Video display data drawn from current bank, however OS 'sees' Bank 0. Type blindly: **poke1,55.**

Notes:

When A10 is considered and AEC is enabled the cursor is 'lost' when Bank 0 is switched out. If AEC is then disabled, the cursor is found in the current bank. Why?

Bank 0 is only brought into context when:

1) address falls below least decoded line (LDL), or

2) AEC goes low indicating VIC DMA.

If LDL is A10 and screen memory is at the default location, the OS acts on the current bank whose screen matrix lies above CRAM. In this sense, the cursor isn't lost. The OS is happily updating the cursor and the video matrix. However, since it knows nothing about the expansion ram, its updating the current bank. The reverse is true when A10 is not considered and AEC is disabled.

P.B.

```
;****************************************
;*          Config256.hdr               *
;*                                      *
;* This file contains the header block *
;* definition for Config256.            *
;****************************************

.if Pass1
 .include  Config256.sym
.endif

:Here is the header. The Config256.lnk file will
;instruct the linker to attach it to application.

.header             ;start of header section

.word  0   -        ;first 2 bytes are always zero
.byte  3            ;width in bytes
.byte  21           ;and height in scanlines of:

.byte  $80|USR      ;C= file type, with bit 7 set.
.byte  APPLICATION ;GEOS file type
.byte  SEQUENTIAL  ;GEOS file structure type
.word  $400         ;start address (where to load)
.word  $3ff         ;usually end address, but only
                    ;needed for desk accessories.
.word  $400         ;init address (where to JMP)
.byte  "RamDriver   V1.1",0,0,0,$00
                    ;permanent filename: 12 chars,
                    ;then 4 character ver. number,
                    ;then 3 zeroes,
                    ;then 40/80 column flag.
.byte  "Paul J. Bosacki     ",0
                    ;twenty character author name

                    ;end of header section which
                    ;is checked for accuracy
.block 160-117      ;skip 43 bytes...
.byte  "Configures banked RAM to act"
.byte  "as RAMdrive as under GEOS",0
.endh
```

Continued next month

VizaWrite 64

Peter McDonald looks back at a word-processing wonder that continues to perform

Any selection of Golden Oldies must be personal. My oldest oldie is certainly VizaWrite 64. It is also my goldest oldie, by any test you care to name: highest in my affections, most used, favourite.

VizaWrite 64 was written in Britain by Kelvin Lacy and for some reason which I never understood was marketed (very successfully) in the USA under the name "Omniwriter". You can find references to it if you look at older copies of American Commodore specific magazines (e.g. COMPUTE's GAZETTE or RUN).

I did not come across it by accident. In the early part of 1983 I had been attracted by the advertisements and the reviews. I was not then interested in computing as such; it was word-processing which had fired my imagination and I was slowly coming round to the idea of combining a Commodore 64, with VizaWrite and an Epson FX80 printer. Then I saw an article in The Times by a freelance writer, extolling that very package and saying that it did everything he required of it. That clinched it. I took the plunge.

The manual was not easy going for someone entirely new to computers. But with an occasional piece of advice from people in the great home-micro freemasonry, I was soon able to use my newly acquired technology. I can therefore recommend it to anyone who wants to buy a competent and user-friendly word-processing program for the C64. I would especially recommend it for the person who is primarily a writer and only incidentally a computer-buff.

VizaWrite 64 is available either on disk or on cartridge. Which should you buy? The disk is cheaper, but the cartridge is a joy to use. You can leave it permanently inserted and VizaWrite 64 will load and run as soon as you switch on your computer. I believe (I have never tried it) that you do not need a disk-drive to run it; you can save your documents on tape. If you want your C64 almost exclusively for word-processing, then you might consider buying a 1581 (3.5 inch) disk-drive instead of the more usual 1541. Provided the 1581 is designated as device number 8 (you can do this without opening up the drive) then you can run the program from the cartridge and save your documents to the 1581, thus getting the advantage of the greater speed and storage.

There is not a great deal of commercially produced software for the 1581. But if you are simply in the word-processing stakes, you will not need anything else though Vizaspell (see below) might be ruled out if you do not have a 1541 compatible drive. (I understand that there is in fact a disk command within VizaWrite 64 which enables you save documents to a drive designated as device number 9. I have tried various formulas. But none of them works. If any VizaWriter knows the answer, perhaps he could share it with us.)

Getting Started

VizaWrite 64 begins by presenting you with a "Select Activity" Menu. There are five alternatives, each chosen by pressing one of the F keys. F1 selects "Edit old document"; F3 "Create New Document"; F5 "Directory"; F7 "Disk Commands", and F8 "End of Session".

Taking the last first, you will see that even when you are using a cartridge, you can shut off VizaWrite 64. Press F8 and the screen clears to reveal the familiar "Commodore 64 Basic V2" screen. You can begin to write your world-beating Basic program then and there. (What about commercial programs? My recollection is that most of them can now be loaded, though I seem to recall having difficulties with some when using the VizaWrite cartridge.)

What about "Disk Commands"? This enables you to carry out various operations on the disk, e.g. to scratch a file; to validate the disk, even to format a new one.

"Directory", as might be expected, lists the names of the documents on the disk in the drive. If you press F5 whilst a disk is in the drive, you will be able to see what it contains. This facility is not of course restricted to VizaWrite files; F5 will list the contents of any C64 disk for you....a useful bonus in itself, especially if you want to zip through several disks in search of an elusive file. On the C128 you could use F3 to do this for you, but there is no similar single key command on the C64. Furthermore, there is in VizaWrite 64 a facility for merging a directory into a document on screen, which means you can then print it out, or save it as a VizaWrite document.

Having listed the directory, you cannot load a file (document) directly from it. You have to press the space bar to return to menu, and then choose the F1 (Edit Old Document) option. This, of course, only applies to VizaWrite documents (i.e. those you have written and saved using this program.) Choose that option and you are asked to type the name of the required document. So be sure you note it carefully when you look at the directory!

But before you can Edit an Old Document, you first have to create it. The key for that is F3. Press it and you are again asked for the name. This time, however, you are being asked to say what name you wish to give to the new document when you have written it.

Imagine you decide to call it "test". You type this and press RETURN. Immediately the screen changes to the VizaWrite "page", that is to say, the screen upon which you are to write. You will see that already the words "name-

:test" appear at the top of the screen. A status line tells you that you are page 1 of 1 Line 1 col 5. "Page 1 of 1" sounds strange, but don't worry. When you have written three pages, and you go back to the first, it will then say that it is Page 1 of 3, and that sounds much more sensible.

Formatting and Printing

Below that line is a format line. This governs two main features: the lay-out of the page (width of margins; length of lines, "tab" settings, etc) and the variations (depending on the versatility of your printer) in type size and style (e.g. italic; double width; emphasised; elite size; pica size; etc).

There is no point in going into more detail here. It is sufficient to know that a reasonable number of variations is possible. A freelance writer will be able to print everything he could have typed on a typewriter; if he is using a dot matrix printer, he will be able to do very much more. (Indeed it is possible to produce quite a passable "letter heading" by ringing the changes on type-faces.) Many of the commands which govern format are available as key presses within VizaWrite. For instance, Control-i, causes the text to indent to the next tab setting, and it will go on printing at that setting (i.e. in a column) until you press RETURN, to pass to the first line of a new paragraph. Again, Control-c puts a diamond shape in the centre of the current line (it does not show on the page when it is printed out). Anything you type on that line will be automatically centred. (e.g. "Yours sincerely" at the end of a letter).

By moving the position of the end tab on the format line (by inserting extra characters, or removing some) the length of the line can be varied, so that the word-wrap, which occurs at the end of the line, will coincide with the number of characters you want to appear on the line (e.g. about 74 if you are using pica). In fact 74 is the "default" setting i.e. the length your lines will be unless you vary the format line. Obviously the line length has to be governed by the size of font your printer is to use, and by the margins you wish to appear on each side of the paper.

Now I will mention the great bugbear of C64 word-processing programs. The normal line on a page of typing accommodates 80 characters. But the screen used with the C64 takes only 40 characters (unlike its big brother the C128, which takes 80). VizaWrite copes with this anomaly by giving you a choice of two widths. You can have the line set at 74, so that the cursor scrolls along it, and only shows you 40 characters on the line at any given time. This is essential if you want to work out how your document will look; how many lines and pages there will be, etc. But it is rather wearying to see the words scrolling off the page to the left all the time when you are typing.

By pressing the Commodore logo key and then w, however, you can reduce the length of the line to 40 characters. This makes it easy to read and my tip is that you should always use this when writing. At that stage, it is the composition of the piece which matters, not the way it will look in print. When you have written it, altered it, checked the spelling, and amended it, that is the time to complete the formatting. By repeating the command (logo; w) you can restore the lines to full length. Then fix your page endings. That is really the last thing you should do because, once it is done, it becomes difficult to read your manuscript on the screen.

"At that stage, it is the composition of the piece which matters, not the way it will look in print."

Now for printing. By pressing logo and the p you bring the print options to the screen. These let you decide if you want a header, or justification (right margins, as well as left margins, lining up) or single sheet or auto line feed, etc. You also have to enter the type of printer you are using (default is "v", for Vic, indicating Commodore printers). My STAR LC-10C seemed to respond OK to "e" for Epson-compatible, but I did not give it a full test. You just have to experiment, and Viza Software are good at giving a helping hand if you approach them.

Facilities

It would be a bore to describe all the usual facilities which VizaWrite 64 shares with other word-processors. These include the ability to insert an unlimited amount of text at any point; to move blocks of text from one position to another; to merge items from another document (and thus to handle mail-shots); to delete text; to copy it; and so on. The print options allow you to print single pages, or pages in sequence (e.g. start on p.3, end on p.5). This is useful if you spot a mistake on a page after it has been printed. You can amend it and reprint that page. Unfortunately you cannot instruct the printer to make more than one copy. However, if you wanted to take (say) 12 copies of a one-page document, the easiest solution is to use the copy facility to turn it into a 12 page document, in which each page is the same. You then print it once, and this will have the same effect as if you had been able to order 12 copies of a one-page document.

Spelling? There is a separate spelling-checker on sale called "Vizaspell" and this works efficiently. However, a good tip is to create your own dictionary instead of using the dictionary supplied. Why plough through 30,000 words when the working vocabulary of the average writer is much, much less than that? Vizaspell enables you to make your own dictionary, restricted to the words you would normally use. (Incidentally, I had trouble using the Vizaspell facilities with the SX64. This is not just me; I know another SX64 owner who has exactly the same problem.)

Conclusion

Any snags? The worst, which always creeps into the conversation when VizaWrite 64 owners swop notes is the famous "save and replace" bug. First it was said that it did not exist; then they found a cure for it! But the cure is not incorporated in VizaWrite, even if it works. The bug manifests itself when you create a document, save it, open it again, alter it, and then try to save the amended version under the original name. Unfortunately the fact that the bug has bitten is not evident until you next try to open that document. Instead, you will find that another document keeps appearing instead. And there is nothing you can do to restore the position. For all practical purposes, the document is lost. And that can be a very frustrating experience. There are, of course, simple safeguards. Instead of resaving a revised document under the old name, you can change the name slightly and save it as a completely new document, scratching the old one at that point if you no longer need it. Or you can simply save the revised document, under the old name, but on a different disk.

"So if you are a comparative newcomer to the C64, and want to try your hand at word-processing, give VizaWrite 64 a trial."

So if you are a comparative newcomer to the C64, and want to try your hand at word-processing, give VizaWrite 64 a trial. I am quite sure you will be glad you did. Others would of course nominate other word-processors for the C64 (Superscript and Paper Clip, for instance have enthusiastic advocates). I have tried others. But I have always returned, with some relief, to VizaWrite.

Does this mean that VizaWrite 64 is better than the others? Not at all. It simply means that we all tend to prefer the word-processing program we know best. And I am no exception.

P.M.

Compunet

Jonathan Littlewood spends 'An Evening on Compunet'

It's mid-evening and the family are watching the box. There is nothing much on so, bored, I slip out, make a large mug of strong, black coffee and take it upstairs to where the Commodore C64 awaits. A minute or two later I have loaded the particular blend of communications software I find the best.

Having checked the telephone line is free I type the number of my nearest ISTEL node into the C64 and the Compunet software takes over. Exactly eleven seconds later ISTEL answers and the C64 asks it for a connection through the network to the Compunet machine in London. A few seconds later and the familiar Compunet login screen appears. I type in my username and password and I'm suddenly in another world.

Most Compunet users have a standard route through the database. I always start off at TODAY. This is the area where our illustrious Compunet editor gives the low-down on what is been happening on the net. The latest big news is that Compunet are hoping to set up a regular Celebrity Chat-Line. Either the existing Chat or Party-line sub-systems will act as the host for these, hopefully, regular events. Users will get the chance to put their questions directly to the guests. Unlike a normal interview the audience get to ask the questions they feel are important. The only problem is that nobody seems to have heard of the first celebrity guest!

> ***"The latest big news is that Compunet are hoping to set up a regular Celebrity Chat-Line."***

After TODAY my next port of call is REVIEW, where a directory has been set up for the reviewing of each days uploads. I quick peruse of that reveals a few uploads that sound worth a read or a download later in the evening.

The next port of call is NICKS, a particularly interesting area run by Nick Law, (NFL1 to his friends). Nick has been involved in computer design since the early seventies and has uploaded a series of articles about computer design both then and now. In this area there are some fascinating stories about sixties computers and a technical overview of microprocessors, from the 6502 to the 68000.

> ***"In many cases such programs have pushed back the frontiers of what can be achieved on the C64."***

Having satisfied the intellect the next task is to find the latest in demos. Ever since Compunet began people have been writing demonstration programs to highlight their programming skills. In many cases such programs have pushed back the frontiers of what can be achieved on the C64.

Once upon a time a nice hi-res picture and a bit of music would have been considered a quite good demo. Today standards are somewhat higher. Simultaneously moving ninety-six sprites, playing digitised music and scrolling messages in the border seems to be par for the course. And that's on the C64. Now on the Amiga...

The Dral (Compunet's Databased Editor) has recently reorganised the Demos 'Hall of Fame' at DEMOH. For a while nothing much seemed to be happening there, but the best of the old demos have been archived off to a new area called 'The Elite' (ELITED) and the 'Hall of Fame' is once more being used to store the best new demos loaded to the net. In the near future 'Halls of Fame' for the music, art and games program areas will be set up too.

To find out about new programs to download I always check NEWSW. This director lists all the programs recently uploaded to the net. The Commodore C64 owner is the luckiest here, in the first half of June one hundred and eighteen new C64 programs were uploaded and made available to Cnetters. In the same period twenty six Amiga programs made an appearance along with only four pieces of Atari ST software. Guess which is still the more popular machine!

One of the areas mentioned in REVIEW contains KPC83's daily uploads of weather satellite pictures in Amiga IFF format. These are easily downloaded and can be viewed with most graphics packages. Compunet has carried weather forecasts for some time – now we get the satellite pictures too.

Amongst the curiosities I found during this little tour was a directory, PEANUT, dedicated solely to the pleasures of peanut butter. Its contents varied from a rather mouth-watering recipe for Peanut Butter Cookies, to interviews with famous (and infamous) Cnet users concerning their taste for the peanuts. Strange indeed!

Another curiosity is the 'World's Worst Art' at WORST. This collection of lo-res C64 screens is bad! Not content with garish combinations of colours and crude detail some 'artists' have included some pretty awful visual gags. This area can certainly be recommended for a quick cringe between visiting more serious parts of the database.

> ***"This area can certainly be recommended for a quick cringe between visiting more serious parts of the database."***

An interruption from below ... the family desire my presence. I log off from Compunet and return to the 'real' world. An hour and a half has gone by, a couple of disks have been filled and a mug full of cold coffee sits beside the C64.

J.L.

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So you can get the smallest pocket computer in the world (and it's also a calculator, electronic notebook and an alarm clock!) for £22.95 (including batteries and p & p). No more bits of paper, with the DataStar 8000M, wherever you go, you'll have bytes of vital information right in the palm of your hand.

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Please allow 28 days for delivery C9082

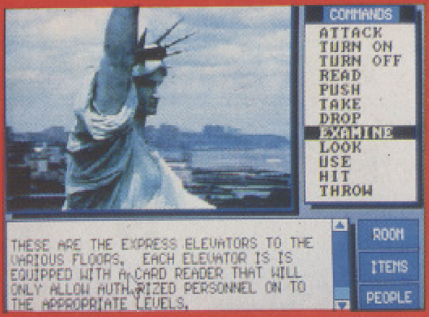
Red Hot Games *For Late '89*

Tony Horgan reports on the red hot games soon to be seen setting the UK machine afire!

With the peak sales period emerging over the horizon, anyone who's anyone in the games biz is hurridly putting their Autumn/Winter release schedule into practice. The recent Consumer Electronics Show in Chicago served as a platform for the wares of many US software houses, just as the PC Show will for the Europeans in September. The red hot games are almost here!

Accolade

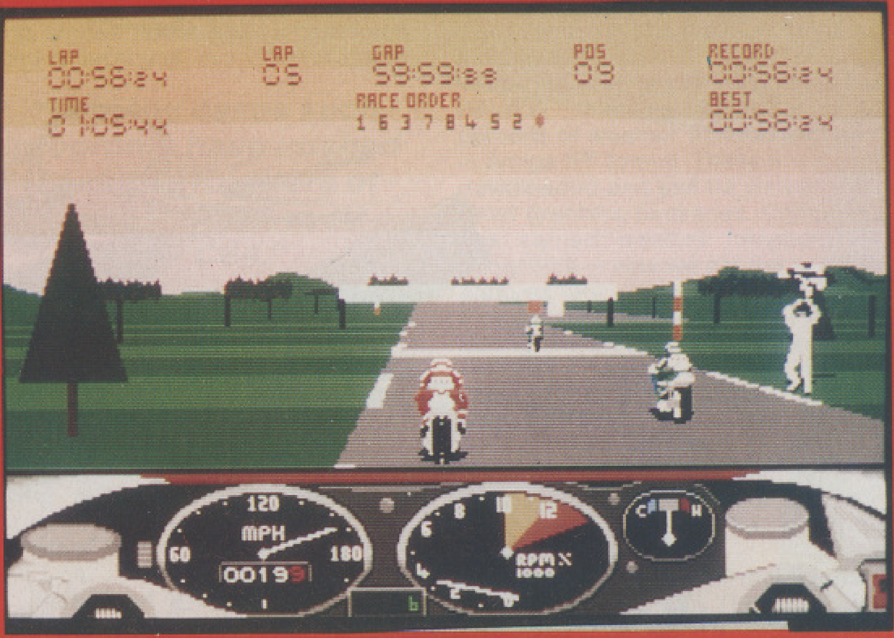
Accolade, currently enjoying success with the classy Amiga version of Grand Prix Circuit, have a follow-up in the pipeline. Simply titled *The Cycles*, it takes the core of 'Circuit and improves upon the idea. There are 15 international circuits to race in one of three performance classes, against nine world class Grand Prix riders.



THESE ARE THE EXPRESS ELEVATORS TO THE VARIOUS FLOORS. EACH ELEVATOR IS IS EQUIPPED WITH A CARD READER THAT WILL ONLY ALLOW AUTHORIZED PERSONNEL ON TO THE APPROPRIATE LEVELS.

The Third Courier

Eye of the Storm is a simulation of a different kind. It's a helicopter combat sim set in the Vietnam war, and looks like narrowing the gap in technical progression that has grown between jet and helicopter simulations. Its stunning landscapes constructed of filled three dimensional polygons, 360 degree first person perspective, and low-level combat missions should add up to the best chopper sim yet.

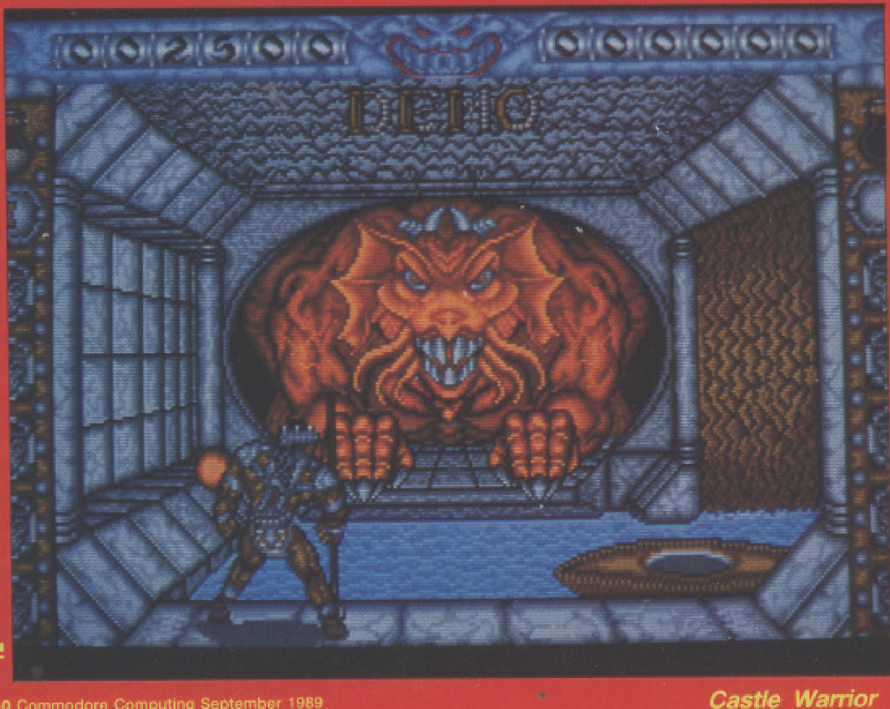


RVF

Accolade continue the solid 3D theme with *Heat Wave*, an "Offshore Superboat Racing Simulation". Others on the way include *The Third Courier*, role playing game of spies and espionage, in which you must reclaim NATO's stolen defence plans before they fall into the hands of the Soviets. Further adventures include *The Deadlock Files*, in which you must clear your name from a plot to overthrow the US government, and *Don't Go Alone*, a spooky role player set in a haunted house.

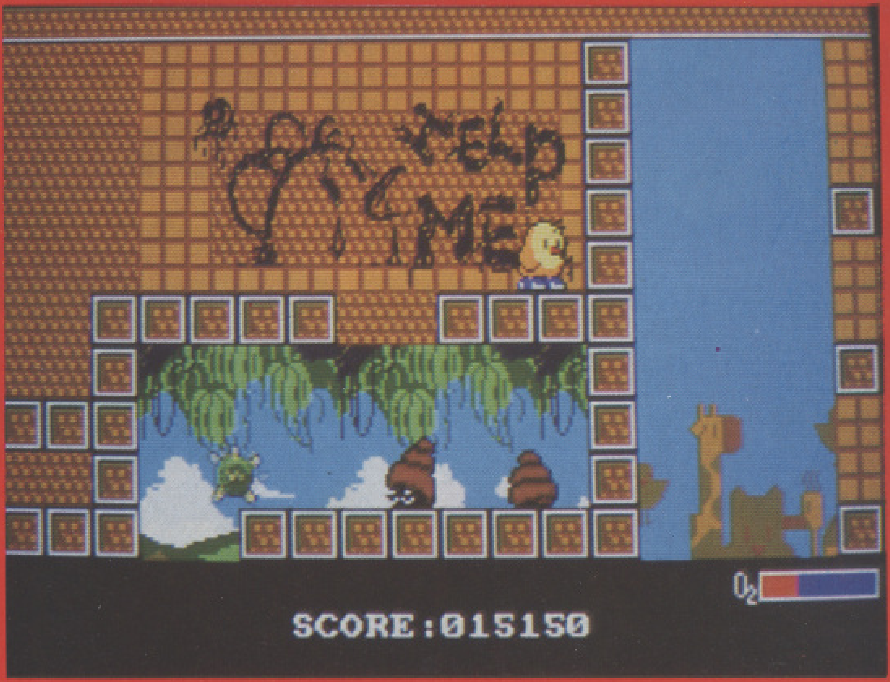
Epyx

From Epyx, overshadowed by news of the amazing portable colour LCD console, the Advantage, is *California Games II!* The sequel to *CCI*'s all time 64 favourite, featuring some of the



Castle Warrior

New Zealand Story



best sprites ever to appear on an 8-bit machine, promises a second collection of California's most popular sporting pastimes. We can't wait.

US Gold

Also to be released in Europe through US Gold are the two forthcoming Indy games. Since the Nintendo console is now the preferred choice for American joystick junkies, the US market for computer games software tends to revolve around the older generation's PCs and Amigas. The higher age group of owners of "real" computers is reflected in the more brain-teasing software that appears from the US. To match the differing tastes of both Americans and the rest of the world, US Gold are overseeing the programming an action game in the UK, while Lucasfilm Games have combined the unique adventure style of *Zak Mackraken* with *The Last Crusade*, and come up with a completely different game. While the action game will be available for both the 64 and Amiga, Lucasfilm's adventure is 16-bit only.

California Games II!

Cinemaware

Creating their own movies, Cinemaware are turning from the power struggle of *Lords of the Rising Sun*, back to the less serious style of *Rocket Ranger*. *It Came From The Desert* is Bob Jacob's tribute to the early science fiction films of the fifties. When a meteor lands outside a lazy Arizona town, strange things start to happen. Ants the size of a double decker bus invade the town, and among the hysteria, with a cool head you take it upon yourself to show them who's boss. It's early days yet, but *It Came From The Desert* looks to be a scorcher. This is to be followed shortly by the second in the TV Sports range, *Basketball*, which will feature all the arcade and strategy elements you would expect, plus plenty of pre-game waffle from the commentator.

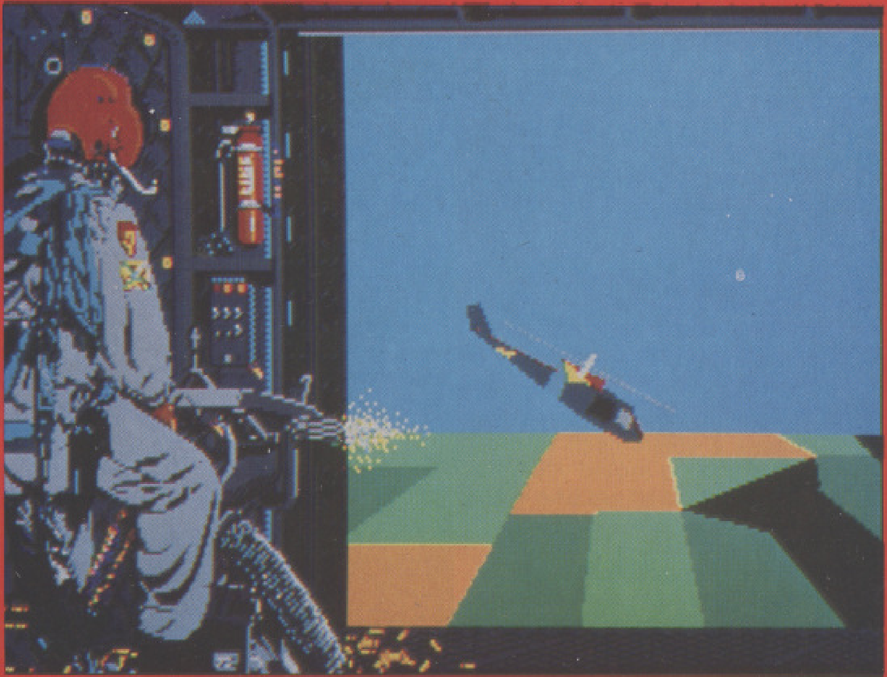
Mirrorsoft

Releasing mission disks and scenery files is a popular method of prolonging a game's life. Mirrorsoft are about to unleash a second disk for their extremely well-received *Falcon*. The new data completely replaces the original scenario, taking you from the desert and dropping you right in the thick of a raging battle of land, sea and airbourne units. Electronic Arts' highly original *Populous* is also lined up for a data disk rejuvenation. Modestly titled *The Promised Land*, it should be available from September. Further releases from EA include *Budokan*, an oriental ninja beat 'em up, and *Kings of the Beach*, the conversions of the PC volleyball simulation.

Ocean

More volleyball is on the way from Ocean via their French connection. *Adidas Beach Volley* takes you on a tour of the World's volleyball courts and beaches, including France, Britain, The Bahamas, America and Japan. Graphics are looking brilliant with stylised characters that could have come straight off a coin-op, and the word is that the animation is just as hot.

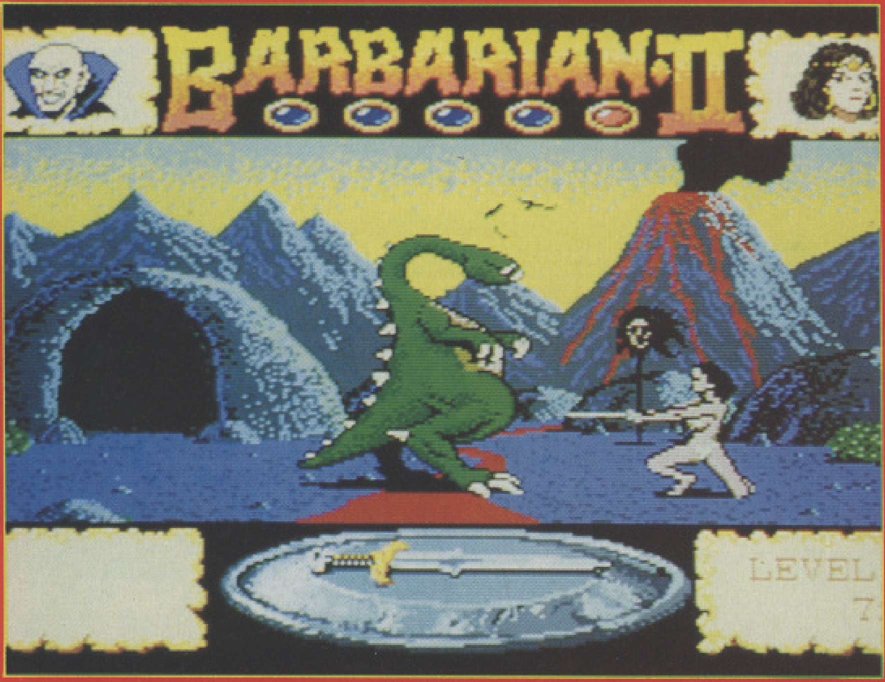
Similarly cute are Ocean's imminent conversions of the Taito coin-op *New Zealand Story*. The title sequence shows a mean old blubbery walrus making off with a sackful of cuddly kiwis. One manages to struggle free, and sets out to rescue his pals. It's a brilliant platform game from the makers of Bubble Bobble, which, although was not such a smash in the arcades, deserves greater success when it hits



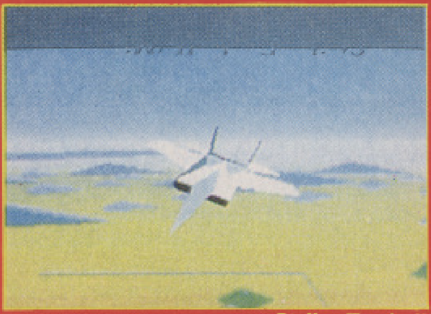
Eye of the Storm

continued on page 52

continued from page 51



the home computer formats. The Amiga version, still under development, is the nearest to completion. First impressions are excellent. Clear, bright graphics, bouncy sound, quality programming and a classic design are adding up to one of the most playable game to appear in ages.



Strike Eagle II

Virgin/Mastertronic

Virgin/Mastertronic's *Silkworm* is about to be followed up by the conversions of another of Tecmo's little-known coin-ops, *Gemini Wing*. Both Amiga and 64 versions of this vertically scrolling shoot 'em up are nearing completion. There's nothing much new or original about the game, but then the same has to be said about the highly playable *Silkworm*. Whether they can accomplish the same feat with *Gemini Wing* should be apparent after its scheduled launch in late August.

MicroProse

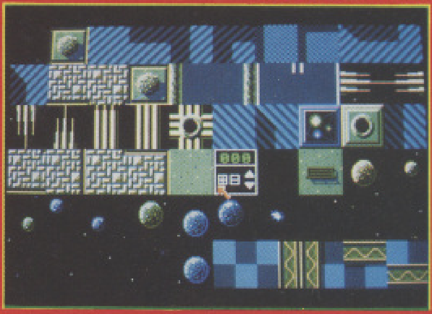
MicroProse have a couple of interesting titles under development. Details on *Strike Eagle II* are scarce, but from what we have seen so far, it'll give *Falcon* (and its mission disk) a run for its money. Nearer to release is *RVF*, a simulation of the Honda RVF Formula One Bike, ridden by the current TT and Formula One World champions Joey Dunlop and Carl Fogerty. In true MicroProse style, *RVF* is primarily a simulation, but promises to deliver gameplay to rival the best of its arcade counterparts.

Palace

Palace, still refining, retouching and tweaking the Amiga version of *Barbarian II*, are about to release their second game from the French publisher Delphine. *Castle Warrior* is a multi-stage arcade adventure, in which you ride subterranean rapids and battle against huge dragons. In common with most French games, it doesn't really fit neatly into any particular category, containing arcade, role playing and adventure elements, along with some weird graphic effects.

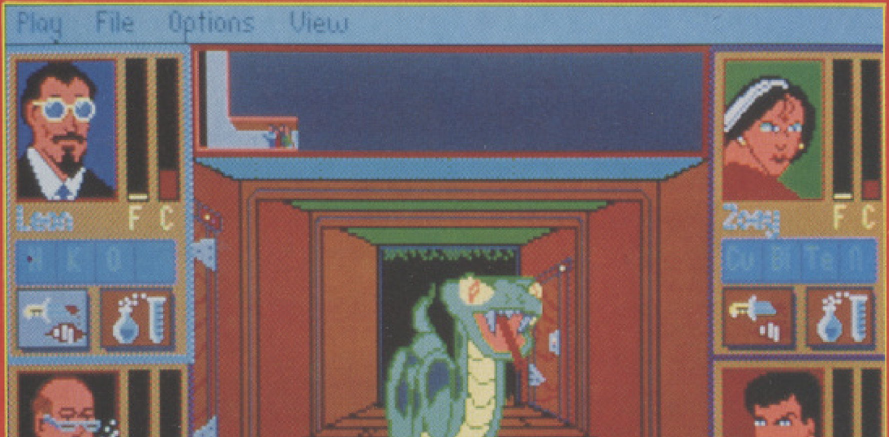
At last the long-awaited *Shoot 'em Up Construction Kit* is actually complete in Amiga form! Like the original 64 utility, it gives the non-programmer the ability to create his very own one or simultaneous two player shoot 'em up. The limitations are that it must scroll from top to bottom, or take place on static screens, and unfortunately, extra weaponary is not an option. Other than that, you are only limited by memory and your imagination. Sampled sounds can be included and played back at varying sample rates to create even more effects. Three games come with the package, and anything you create yourself can be marketed without any fees due to Palace.

Construction Kit



That sums up some of the blistering releases that should heat up the shops any day now. Normally the Autumn and Winter bring thoughts of the impending cold but not this time.

T.H.



spirit snake appears
monster a

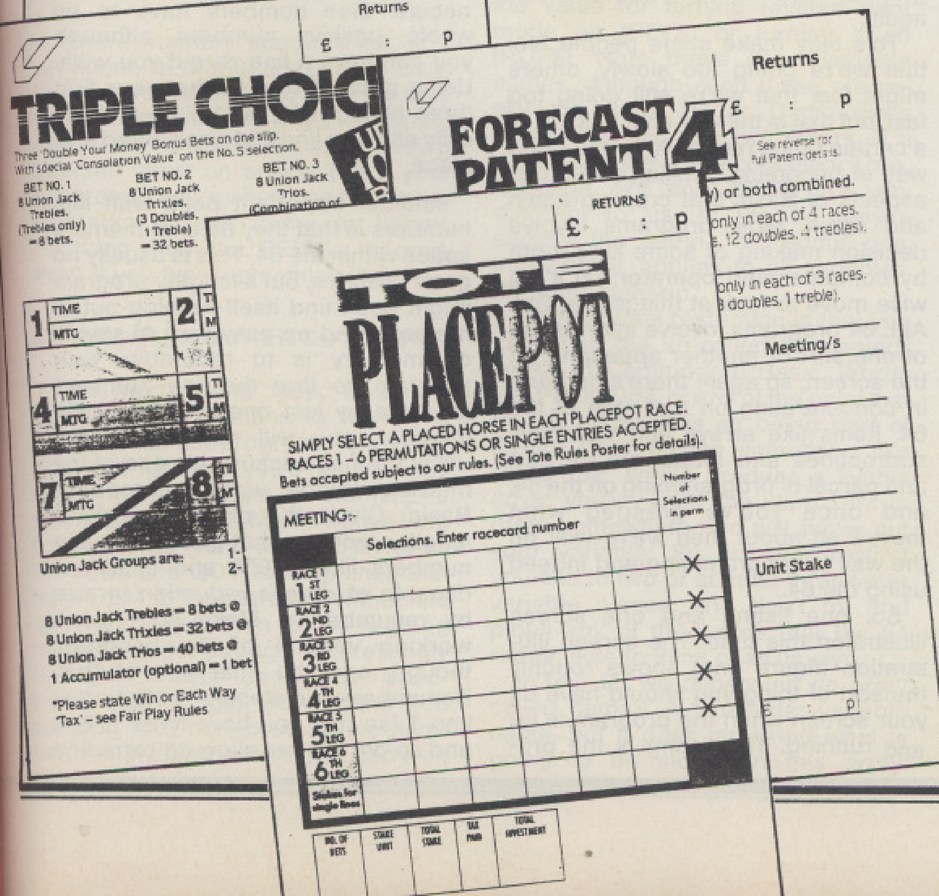
May The Form be with you...

Don and Mark Smiddy team up for a day at the races and check out a betting system which claims to beat the bookies.

In life few things are a certainty; nowhere is this more true than on the racecourse. The smell of the freshly cut grass, the roar of the expectant crowd, the sound of hooves galloping across the soft turf...all create the atmosphere of horse racing. As close inhabitants of an area that lays claim to one the finest flat racecourses in the country, racing is in our blood; consequently, we put Cascade Systems' 'Form Master' through its toughest test this side of the UK corral.

The system is supplied on a single bootable disk accompanied by a large ring bound manual; herein is where the journey into the world of professional punting begins. For once at least, this is a manual which must be thoroughly read and understood before making your first excursion to the bookmaker. A warning to this effect appears within the first few pages of the manual, so you have no excuse for losing a fortune.

Next up, the manual gives a very detailed overview of the whole system and gives a few tips on how to choose suitable races. At first glance, it appears there are very few races for which the system is any good. However, this does reduce the element of chance somewhat. Very briefly: Form Master can be used for both Flat and National Hunt races for two year olds and upwards. Although it can be used for races outside the UK, continental racing is not covered in great detail. Finally, it appears to work best when handicapping is in operation.


Returns
£ : p
TRIPLE CHOICE
Three 'Double Your Money' Bonus Bets on one slip. With special 'Consolation Value' on the No. 5 selection.
BET NO. 1 8 Union Jack Trebles. (Trebles only) = 8 bets.
BET NO. 2 8 Union Jack Trixies. (3 Doubles, 1 Treble) = 32 bets.
BET NO. 3 8 Union Jack Trios.
TIME
MTG
Union Jack Groups are:
8 Union Jack Trebles = 8 bets @
8 Union Jack Trixies = 32 bets @
8 Union Jack Trios = 40 bets @
1 Accumulator (optional) = 1 bet
*Please state Win or Each Way 'Tax' – see Fair Play Rules
FORECAST PATENT 4
See reverse for full Patent details.
or both combined.
only in each of 4 races.
12 doubles, 4 trebles).
only in each of 3 races.
doubles, 1 treble).
Meeting/s
Unit Stake
RETURNS
TOTE PLACEPOT
SIMPLY SELECT A PLACED HORSE IN EACH PLACEPOT RACE. RACES 1 – 6 PERMUTATIONS OR SINGLE ENTRIES ACCEPTED. (See Tote Rules Poster for details). Bets accepted subject to our rules.
MEETING:-
Selections. Enter racecard number
Number of Selections in perm
RACE 1 1ST LEG
RACE 2 2ND LEG
RACE 3 3RD LEG
RACE 4 4TH LEG
RACE 5 5TH LEG
RACE 6 6TH LEG
Stakes for single lines
NO. OF BETS
STAKE UNIT
TOTAL STAKE
TAX PAID
TOTAL INVESTMENT

From here on in, the text goes into painstaking detail about horse form and how to rate (chhose) horses given information supplied either The Racing Post or The Sporting Life. Both publications are equally valid and well covered; we used The Racing Post. Form figures found in other daily papers are unlikely to be detailed enough to cover all variables required by the program. Overall, Form Master's manual is aimed primarily at beginners - seasoned punters are likely to find it easy going.

Can it get any worse we ask ourselves? Unfortunately, it can. At one point you are asked for a number - press a letter and the program crashes. Ask for a print out of the results - crunch. Worst of all, if you do make a mistake, you have to enter all the information again. The program does not even provide a summary and something like the question 'All correct Y/N?'

"In spite of all this, there is no doubt the system employed by Form Master works - we are averaging a slight profit."

In spite of all this, there is no doubt the system employed by Form Master works - we are averaging a slight profit. However, the program is by far the worst commercial offering we have ever come across - having entered far friendlier ones from magazines.

Admittedly, if you are prepared to put up with the fragile user interface, numerous bugs and make do with messy displays, Form Master should pay for itself inside a season. Think carefully before parting with cash for this - and the best of luck if you do.

M.S.

Price: £79.99. Available for: C64/128, Amiga and MSDOS. Contact: Cascade Systems, 1-3 Haywra Crescent, Harrogate, North Yorkshire HG1 5BG. Tel: (0423) 525325

Back To Basics

Part IV

Peter Gerrard continues his informative series on Basic programming

Learning to program, like learning a foreign language, is never easy. A Grade 5 at O-Level in Latin and French should show how far I managed to progress in those particular languages! They were hurriedly dropped A-Level, which was all science and which ultimately led me into the world of computers, where I could start learning to program.

My first attempts were on a machine the size of Wembley Stadium, or so it seemed, and the programming language that we were using at the time was Fortran. Marvel for a short while, if you will, of the power of the 64; a small desk-top computer that has keys that allow you to program it. I had to use a kind of Heath Robinson typewriter to produce punched cards that were given to a technician who might, in due course when the mighty computer was not ill, feed them to the beast and, hours later, give me the result: syntax error, usually, and the whole process had to be repeated again. A simple ten or twenty line program might take several days to run properly, longer if someone kindly shuffled your punched cards for you while your back was turned. Line numbers didn't exist. And Fortran? If you don't HAVE to program in Fortran, don't. It's all very well in its place, but on the Commodore 64 it would appear (to me, at any rate) to have very little use.

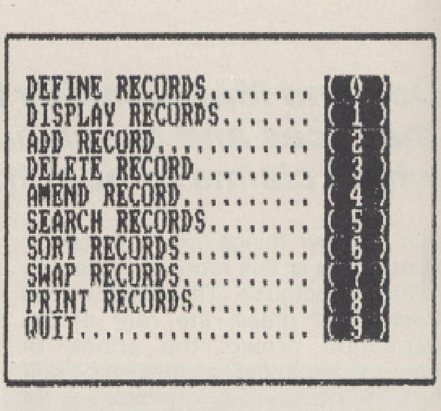
My first experience in Commodore Basic was on a Commodore Pet in 1979, when I was employed as a humble junior by CBM and spent most of my time answering the telephone and telling people the name and address of their nearest dealer. After I had managed to write a few programs in my spare time (10 GOTO 20, that sort of thing) I persuaded the powers that be to loan me a machine. I took it home, got stuck in, and developed whatever programming style I have. I also spent an inordinate length of time playing a program called Star Trek, written by one Deri James, but we all have our weaknesses.

I explain all this to show that it took me a long to get to grips with programming, and also to show that there is a lot to be said for Commodore Basic, despite all the people who continually knock it. My first Commodore PET (if you'll pardon the expression!) had a tape deck as storage and a mighty 8K of memory, or about one-fifth of th easily available memory space on a 64. If you can squeeze a program into 8K, the 64 holds no terrors. Also, by having a total absence of commands to control sound and graphics, apart from PEEK and POKE, you learn a lot more about the machine. You learn from your mistakes, so they say, which should make me the smartest person in the world.

Learning from mistakes IS a good way to learn, and although (to paraphrase a reader's letter) I am not deliberately leading you up the garden path, if a typesetting error does occur and you manage to correct it, then you are learning something and that is clearly A Good Thing. On the other hand, if you can't correct it then we're not going to get very far, so this month we'll review the opening program and go through every line of it again.

This may make some people feel that we're going too slowly, others might feel that we're still going too fast, but that is the way of things. Up to a certain point, repetition is one good way of becoming familiar with those aspects of Basic that crop up again and again. Most programs involve decision making of some kind, both by computer and operator, so it's a wise move to look at things like that. ALL 64 programs involve information of one sort or another appearing on the screen, so again there's no harm in concentrating on that side of the 64. Items like arrays and variables, subroutines and loops, are all part and parcel of programming on the 64, and once you've grasped what they're all about then we're well on the way to programming and indeed using the 64.

So, one listing and one screen illustraion this time. The screen illustration (figure one) shows roughly the sort of thing you should have on your screen when the program is up and running. The listing is the program that is designed to achieve this screen display, so on to that listing.



```
DEFINE RECORDS........ ( 0 )
DISPLAY RECORDS....... ( 1 )
ADD RECORD............ ( 2 )
DELETE RECORD......... ( 3 )
AMEND RECORD.......... ( 4 )
SEARCH RECORDS........ ( 5 )
SORT RECORDS.......... ( 6 )
SWAP RECORDS.......... ( 7 )
PRINT RECORDS......... ( 8 )
QUIT.................. ( 9 )
```

You will note that, most of the time, the line numbers go up in steps of ten. There is no great reason for this, they could go up in steps of five if you wanted them to, but these gaps of nine potential line numbers between each existing line can be used whenever something crops up in a program that you didn't think about at the time. If your program has line 1, followed by line 2, line 3, and so on, you cannot insert line 2.5 if a disaster occurs. Line numbers have to be whole, positive numbers, although you can have a line zero if you wish. Using gaps of ten, so that your first three lines might be 10, 20 and 30, esily allows a line 25 to be slotted into place.

Another important point with line numbers is that they take up memory space within the 64. This is usually no great problem, but a lengthy program might soon find itself running out of memory, and an easy way of saving on memory is to renumber your program so that the line numbers increase by just one at a time. Remember, you will need a special utility for this, because it's one of the missing things with Commodore Basic. Given the utility, though, a lengthy program that goes up to line numbers like 40,000 and 50,000 is capable of drastic reduction in size by renumbering. Make sure it's a working version of the program, though, and the final one at that. Renumbering in steps of 1 starting at line 1 (so that you have lines 1, 2, 3 and so on) will not allow an extra line to be inserted later.

Finally (as far as line numbers are concerned), a plug for Commodore Basic. Some people argue that GOSUB 2000 (for example) is sloppy programming, as is GOTO 2000. Having seen enormously long BBC Basic listings, in this respect at least you can give me Commodore Basic any day. BBC Basic uses things called procedures in preference to subroutines, so that a typical BBC Basic line might be PROCfred, whereas the Commodore equivalent might be GOSUB 2000. So in Commodore Basic, you know that you must look to line number 2000 to find the subroutine. To find the procedure in BBC Basic you must look for a statement something like DEFPROCfred, which could be anywhere within a six page listing using any sort of line number. GOSUB 2000, easy to find. PROCfred, a needle in a haystack.

So, line numbers in Commodore Basic are tremendously important, as are REMark statements. Line 280 in our listing is a typical example, where we have:

```
280 REM PUT UP SCREEN DISPLAY
```

This tells us that the next section of the program is going to put something up on the screen, and is a useful aid for both the programmer and for the typer-in of the program. It gives the program a sense of identity, like line 20:

```
20 REM MENU FOR COMMODORE
DATABASE
```

Where memory space is not at a premium, REMarks are useful things to have dotted around. They do take up memory, which is why they should ideally be omitted if you're finding yourself short on space, but if your program is only a short one then a few REMarks always come in handy. Anything after the REM is ignored, even if you have something like:

```
10 REM IF A>B THEN GOTO 200
```

The moral here, then, is use a REMark by all means to identify a program or subprogram. The computer will ignore it, you'll remember it. Incidentally, a word of warning. If you're removing REMarks from a long program, be very careful. A lot of GOSUBs and GOTOs jump lines that have REM at the start, and if that line no longer exists then the 64 is going to object most strongly. Interestingly enough, Sinclair Basic (viz, Spectrums and things) didn't mind you jumping to a non-existent line number, the program would just carry on at the next line that it could find. Produced many a peculiar error in its day, that did, where you could having a line like GOSUB 980 and the program would immediately leap to line 1200. Again, Commodore Basic scores by not allowing you to be so slapdash.

We have met all sorts of variables so far, those little boxes that allow us to store information for later use. Lines 30 and 40 of our program use several variables of the string variety. String, because of the dollar sign at the end (as in CL$, line 30), and because we're not using numbers. CL$ is defined to clear the screen, which can be tested easily enough.

In direct Basic mode (i.e. without a line number) type PRINT ASC("). You should see a funny symbol between the two quotes. Press RETURN now, and you'll see the number 147 appearing on the screen. At least, you should do! You could now type PRINT CHR$(147) and press RETURN, and watch the screen clear. ASC is short for ASCII, the American Standard Code for Information Interchange, a wonderful collection of numbers that bear very little resemblance from one computer to the next. They do things like clearing the screen, turning reverse print mode on, and so on. CHR$ is short for CHaRacter String, and is essentially the reverse of ASC.

In similar fashion to the above, we can find the values for moving the cursor to the top left hand corner of the screen without clearing it (CH$), the command for turning the print colour to yellow (PRINT CHR$ (158)), the value for turning reverse print mode on (REV$) or turning it off (ROF$). Note these short variable names, although even these are really too long. Under Commodore Basic, only the first two letters of a variable name are recognised. Thus, although ZZ$ and ZZTP$ are very different to us, to the 64 they're exactly the same. The same rule, incidentally, applies to all variables, string or numeric.

Another little restriction is that you can't use the so-called "Reserved" words in Commodore Basic. Words like PEEK, DIM, or any of the ones that the 64 recognises as being part of Basic. Thus, having something like DIM$="52" would produce a syntax error: you've used the word DIM in there somewhere and will throw out your variable. So, try and restirct yourself to two or at most three letter variable names, and don't try and pinch any of the words that the 64 rather likes to think of as its own.

In line 50 we dimension an array called name$. A four letter variable name, but it does indicated what is going to be stored in this array: names. Another point when error-checking your programs. Something like this is easy to type in as mame$ rather than name$. If you then try and say mame$(10)="antony", or whatever, the computer will object, because you do not have an array called mame$. If you'd said mame$(9)="nancy" then that would be all right as far as the computer was concerned, but possibly not all right as far as a working copy of your program was concerned. Arrays only need to be dimensioned if they have an element number of ten or greater, you may recall.

We have discussed the power of arrays before, and indeed they are the most useful of things. Confusing at first, perhaps, but if you think of ordinary variables as boxes then an array is a box with compartments in it. name$(9) would be the ninth compartment in the box labelled name$, for example.

Line 60 sets up two more variables, which form a collection of cursor rights and cursor downs respectively. Quite often we want to position something on the screen given only and X and Y co-ordinate, which in the 64's case in ordinary resolution range from 0 39 and 0 to 24 respectively, the screen being 40 columns wide by 25 rows deep. Not a lot by some standards, but it is enough for us. These two string variables are used in association with line 430 and the LEFT$ command. LEFT$ takes the leftmost part of a string, so that LEFT$(CD$,7) for instance would contain seven cursor downs. By using Y cursor downs and X cursor rights in line 430, and note the very important semi-colons there to inhibit the computer going down onto the next screen line, we can position the cursor at any point on the screen. Then, when we next print something, it will start off at that point.

Line 70 says GOSUB 230, so we turn our noses up at BBC fans and skip immediately to the subroutine starting at line 230 and returning back to the statement or line number immediately after the GOSUB (which takes us back to line 80 in this case) with the RETURN at line 420. All GOSUBs must have matching RETURNs, a most fundamental law.

Lines 230 to 420 seem to have caused a problem or two; they are worthy of further study. Lines 230 to 270 are straightforward enough, if one remembers in line 230 that the keyword PRINT can be abbreviated to ? when entering the line. List it out again afterwards and see. Otherwise we're just using the simple PRINT statement to print information onto the screen. The TAB statement is exactly like a typewriter, so that

cont. on next page

TAB(12) will skip 12 spaces to the right before printing something, and the only other things we use are the string variables that we defined earlier, namely CL$, REV$ and ROF$.

Lines 290 to 360 come next, and all they do is draw a simple box upon the screen. Lines 290 to 310 draw the top of the box, using some of the predefined graphics available on the 64, so just run those three lines in isolation of the rest of the program if you are having a spot of bother. That is, with your master copy safely stored on disk or tape, delete all the rest of the program (or type NEW and enter just those three lines, which is probably quicker) by typing LINE NUMBER (e.g. 20) and then RETURN, which removes a line, and RUN. Lines 320 to 330 then draw the sides of the box, and lines 340 to 360 finish it off. Just try each little group of lines at atime until the whole box appears. Then we've got to fill it in, which is where lines 370 to 410 come in.

We want to fill the box in neatly and tidily, and indeed a great amount of time is spent on developing programs in trying to make them look just that; tidy. Line 370 reads all the data in those data statements contained in lines 440 to 460, and stores it in the various parts of the array name$(). This just demonstrates the power of arrays, and also the power of loops. The FOR ... NEXT set of statements form a useful programming tool. works just as well. It was not easy to go backwards in a loop in Fortran,

You can count backwards in loops, if you like:

FOR I=10 TO 1 STEP-1:PRINT I:NEXT I

Note the keyword STEP there. You do not have to be quite so orthodox, though:

FOR I=30 TO 3 STEP -3:PRINT I/3:NEXT I

which is probably why the process appeals to me.

Another, more orthodox, loop starts off in line 380, and at the start of line 390 we check the length of each name. Since we want them all to be the same length (nice and tidy) we use yet another loop, if necessary, to pad the name out with dots. The keyword LEN gives us the length of the string variable, although it will not work with numeric variables. And why should it.?

Line 400 then prints the name at the correct part of the screen, line 410 continues the loop, and line 420 returns from this subroutine back to line 80. The keyword STR$ in line 410 converts a number to it's string equivalent. Thus STR$(23) would be equal to "23". Note that it puts a space in front of the number, something which we occasionally have to eliminate.

Lines 80 and 90 then wait for the user to press a key, with line 100 just clearing up any surplus memory space if necessary. Line 110 checks that a valid key has been pressed. We only want keys whose ASCII value lies in the range 48 to 57. That is, a numeric key in the range zero (ASCII value 48) to ine (ASCII value 57). The important word in line 110 is OR: IF A<48 OR A>57 THEN. The computer obeys that statement exactly as we would read it. IF A has a value of less than 48 OR A has a value of greater than 57, THEN go on to do something.

That something is reached in lines 120 to 220, the remainder of the program. A marker is put on the screen in line 120, just to show the user which option they've selected, and after the user has made a selection the computer also makes one in line 130 by going to the relevant part of the program. Either we quit, in which case we go to line 220 and end things, or we don't, in which case lines 140 to 217 come into play. Here, by a bit of jiggery-pokery on screen (technical term, there), we get the computer to load the relevant part of our database from disk (or tape: see last month's article). Since we have not written any of these parts yet, nothing much will happen.

Well, I hope that has cleared up any lingering doubts about our first program. You should all have it working properly by now, or you will have before long anyway, so ever onwards and next month we delve into more workings behind Basic and behind our database.

P.G.

```
20 REM MENU FOR COMMODORE DATABASE
30 CL$=CHR$(147):CH$=CHR$(19):PRINT CHR$(158)
40 REV$=CHR$(18):ROF$=CHR$(146):POKE 53281,0:POKE 53280.0
50 DIM NAMES$(10)
60 FOR I=1 TO 26:CR$=CR$+CHR$(29):CD$=CD$+CHR$(17):NEXT
70 GOSUB 230
80 GET A$
90 GET A$:IF A$="" THEN 90
100 OK=FRE(0)
110 A=ASC(A$):IF A<48 OR A>57 THEN 90
120 X=26:Y=9+(A-47):GOSUB 430:PRINT "( ";A$;" )";
130 ON A-47 GOTO 140,150,160,170,180,190,200,205,210,220
140 A$="DEFINE":GOTO 215
150 A$="DISPLAY":GOTO 215
160 A$="ADD":GOTO 215
170 A$="DELETE":GOTO 215
180 A$="AMEND":GOTO 215
190 A$="SEARCH":GOTO 215
200 A$="SORT":GOTO 215
205 A$="SWAP":GOTO 215
210 A$="PRINT"
215 PRINT CL$;"[2CD]LOAD ";CHR$(34);A$;CHR$(34);",8[HOME]"
216 PRINT "[7CD]RUN[HOME]";
217 POKE 631,13:POKE 632,13:POKE 198,2:END
220 PRINT CL$;:PRINT "END OF SESSION.":END
```

continued on page 79

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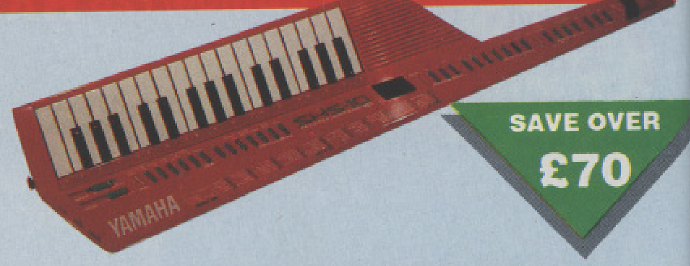

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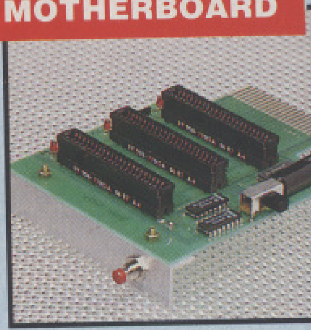

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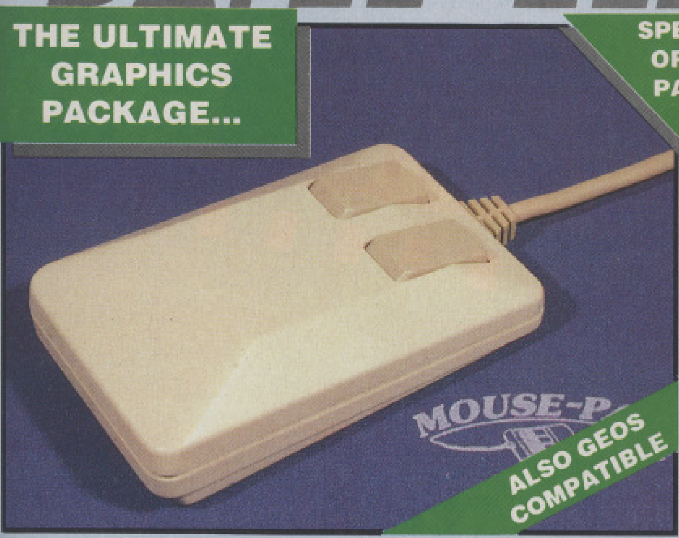

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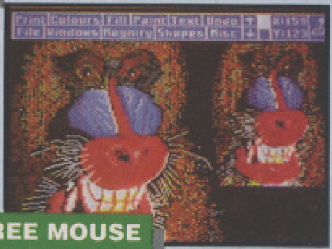
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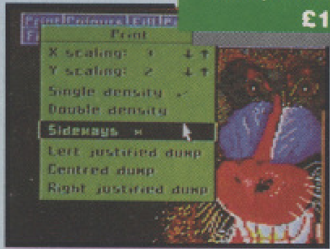

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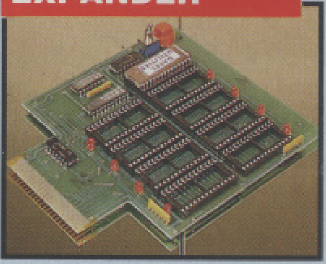

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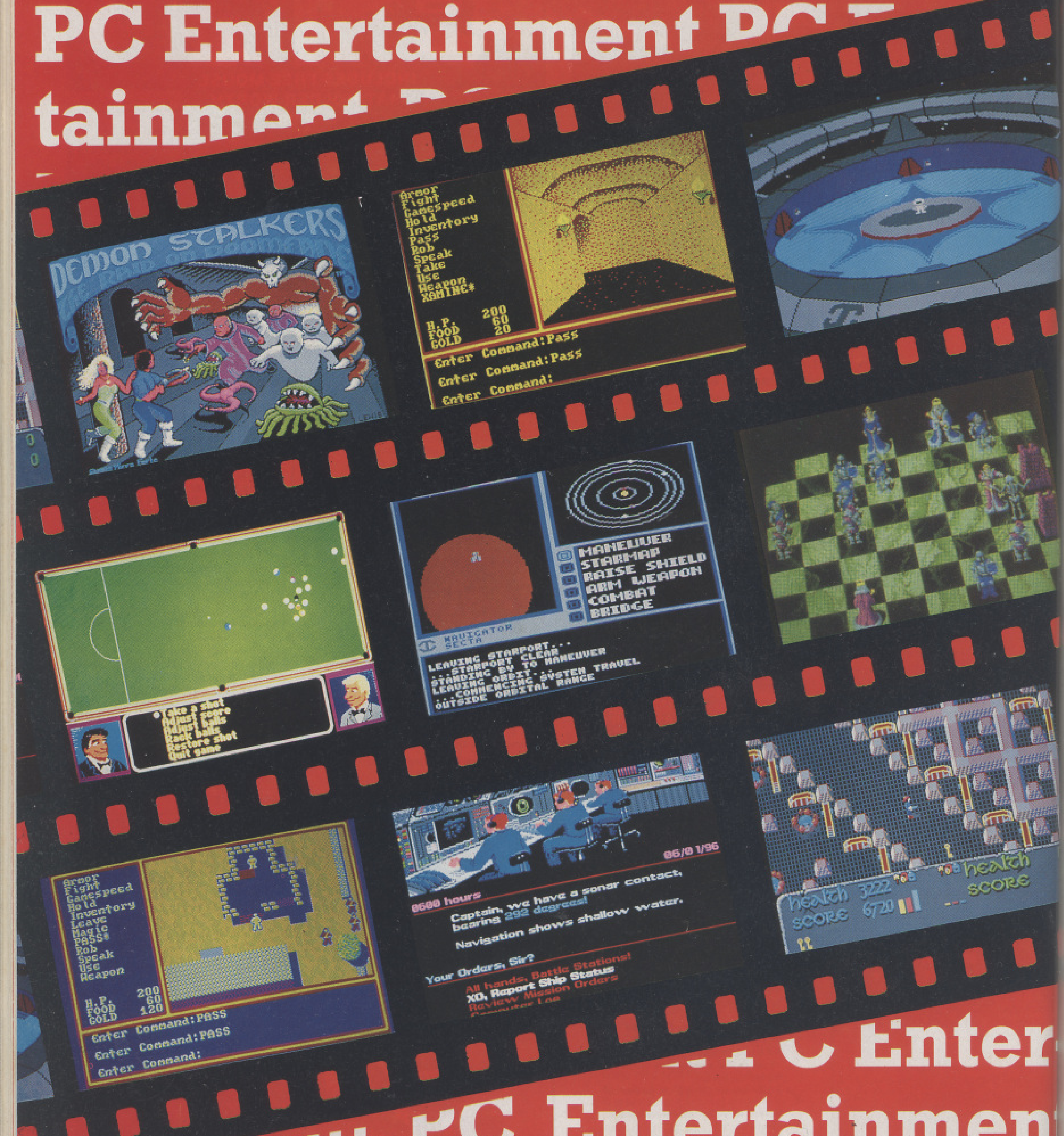
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Enter Command:Pass
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...COMMENCING SYSTEM TRAVEL
OUTSIDE ORBITAL RANGE

Enter Command:PASS
Enter Command:PASS
Enter Command:

Captain, we have a sonar contact, bearing 292 degrees!
Navigation shows shallow water.
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XO, Report Ship Status
Review Mission Orders
Computer Log

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PC Games

Battle Chess

Battle Chess is a conversion from a game already available on the Amiga and it loses nothing in the conversion. It is of course another chess simulation but has a number of interesting and unusual features. Its name gives some of the secret away, for the nature of the game is that of a battle between the individual pieces, as one takes the other.

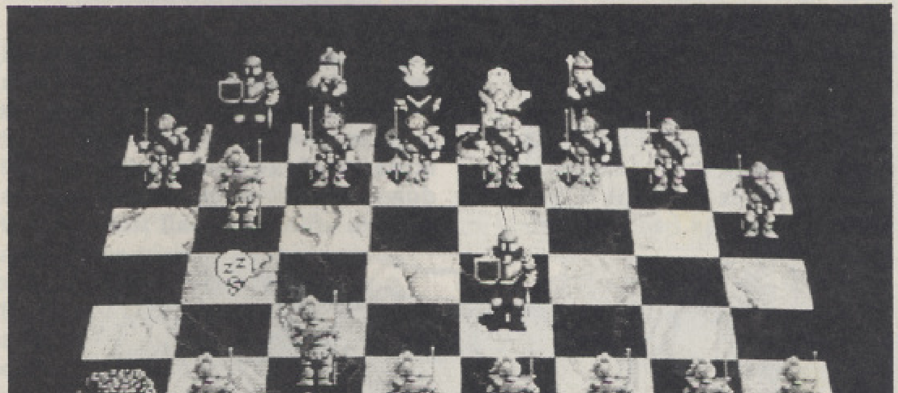
> *"The wit of the authors, Interplay, is evident from the first moves, as the pieces walk to their selected positions on the board."*

The display is of a three dimensional chess board with a set of medieval chess men. This can be changed to a more conventional two dimensional layout but this then loses the whole point of the game, which makes it no better or worse than any of the other chess games on the market. The wit of the authors, Interplay, is evident from the first moves, as the pieces walk to their selected positions on the board. Movement is by way of selecting the square on which a piece is situated and the square to which you wish it to move. This can be done by use of the mouse, joystick or cursor keys.

Each piece has its own movement style and manner by which it battles with the other pieces. It would spoil the game to describe many of these in detail. To give you the a taste of what is in store for you it is worth doing so for one or two. The Rook initially sits in the corner of the board in the shape of the standard castle. When moved, it changes into a menacing stone monster which lumbers to the required position.

> *"He plods slowly across the board while she shimmys to the alloted square."*

The battle between two Knights is straight out of Monty Python with the losing Knight first losing both arms and a leg to be left hopping on one leg before the opposing knight delivers the final blow and chops off the remaining leg. Just one last word on the movement of the King and Queen, he is old and bent and she is young and sexy. He plods slowly across the board while she shimmys to the alloted square. He is not as vulnerable as he seems but I will leave you to find out how he defends himself. The game has all the usual features with drop down menus being used to select which of them are required. It also has nine levels of play with a final level which allows you to select how long the computer is allowed to think. It is also possible to select computer against computer.



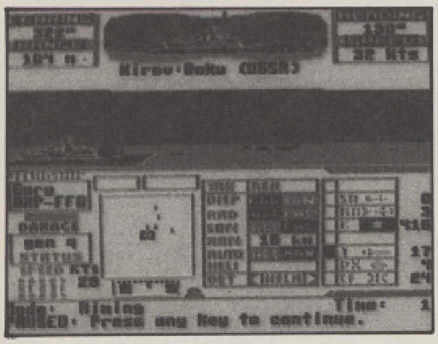
Graphics	95%
Sound	85%
Playability	90%
Overall	90%
Price	£24.95

Strike Fleet

This game is written by the Lucasfilms company and is similar in outline to PHM Pegasus. The difference between the two is that in this game you are in command of a fleet of ships rather than a single hydrofoil. Although the Pegasus vessel can be under your command in this game also.

The main object is to complete scenarios or campaigns, each of which, if successful, will result in you being elevated up the promotion ladder. The initial screen shows maps of the world in which your strikefleet may be assigned. A briefing window gives a short summary of the scenario that is playable on the currently displayed map. A command bar is displayed on the left side of the screen which shows the possible play selections. Scenarios and campaigns can be saved to disk and these can also be viewed from the command bar.

If you decide to select a new scenario, the next phase is to move on to the shipyard. The purpose being to add or remove ships from your fleet and this is done by way of a very full screen. The top third of the screen shows a view of the shipyard. Just below this is a line of 'class indicators' which are the types of ship that are allowed in your chosen scenario, some scenarios only allow one class of ship. Below this, on the left side of the screen, is a larger view of the selected ship along with details of its displacement etc. Below this, on the same side of the screen, is the 'Ordnance window' which gives details of the armaments of the currently selected ship. On the right of the screen is the 'Task Force window' which shows a silhouette of the ships in your fleet.



Mode: Aiming
PAUSED· Press any key to continue.

The next screen displayed is your Command Information Centre and the majority of this is taken up by a map of your patrol area, onto which you can zoom in and out. On the right-hand side is another command bar which allows you to move to the bridge of a selected ship, transfer to the flagship of the next task force (if there are more than one), change flagships, join and split task forces and give orders to the currently selected task force. These are displayed lower down the command bar and consist of destination, speed, crew status and radar/sonar functions (passive or active).

When you select the Bridge command you move on to the final and most complex of the screens. In the top two corners are displayed the Bearing, Range, Heading and Speed of your target. In between these appears a binocular view of your target when one is present. Below this, is a wider view of the horizon and below this, your command panel. This consists of, running from left to right, damage and crew status, your speed, radar screen and compass, command menu and weapons list. All of these are actioned by either using the designated key or by use of the joystick or cursor keys.

The game is very complex, especially the switching of control between one ship and another. However, it will provide the player with a significant challenge, especially in the more complex of the scenarios.

Graphics	*85%*
Sound	*70%*
Playability	*80%*
Overall	*80%*
Price	*£24.95*

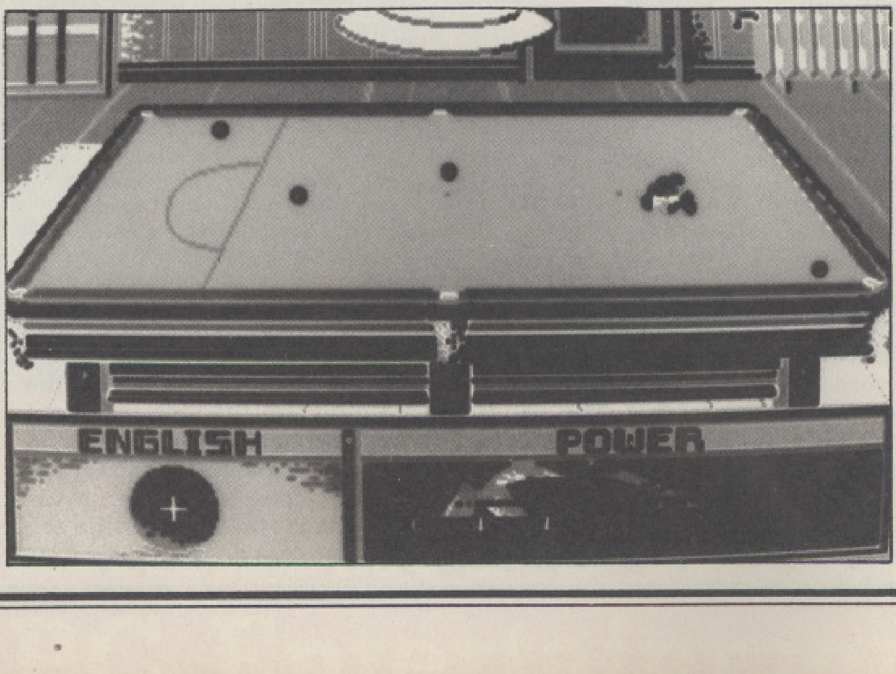
Rack'Em

This is a new sports simulation game from Accolade and is distributed by Electronic Arts. As its name suggests it involves the playing of either Pool or Snooker. While these games are not new to the simulation world this particular version brings a lot of new ideas and provides one of the best approaches to date.

There are four games which can be played: three types of Pool; Straight Pool; Eight Ball and Nine Ball; and of course, Snooker. Once the type of game to be played has been selected, the level of play chosen (Professional or Amateur), the names of the players entered and the coin spun for break, an overhead view of the table is displayed. This takes up the top two thirds of the screen with the bottom section showing pictures of the players, in the centre of which, is the communications window.

As the first shot of the game involves the placing of the cue ball, this is the first action of the game. Once this is done the player is asked to select the ball which is to be hit by the cue ball, this is known as the object ball. The cursor keys or joystick can now be used to move the selector until the ball you wish to play is highlighted. After this is done the option is provided to hit the cue ball off a cushion, or bumper as the cushion is identified in the game. This then allows you to play out of a snooker. Once this has been decided two 'ghost' balls appear on the table which are an aid for you to select the path of the object ball, after it has been hit. This again is done by use of the cursor keys or joystick.

One of the 'ghost' balls appears next to the object ball and the other on the cushion or half way to the cushion, depending on your play level selection. Finally, you can select what 'English' or spin you require on the cue ball and the strength of the shot. These are done by positioning a cross on a picture of the cue ball in the



area you want the cue to hit the ball and selecting the length of backswing on your players arm.

Putting spin on the ball is known as 'English' due to the use of such a technique when English players are involved. The only thing that now remains to be done is to hit the ball. This is done by hitting the 'return' key or fire button when the swinging arm and cue of your player are nearest to the cue ball. Now the view of the table changes to 3D to show the result of your shot, although this can be switched off. Depending on the result the play sequence commences again with either you or your opponent. This time no placing of the cue ball is necessary unless the last shot has resulted in the cue ball being pocketed. All this sounds long winded and slow but the program has been written well enough to make this sequence of actions smooth when playing.

> ***"The game contains some interesting and novel features not available in earlier simulations of the game."***

The game contains some interesting and novel features not available in earlier simulations of the game. The first involves 'Trick' shots and the game has ten of these available. The player can choose to view the 'Trick' shot or attempt to play it. Playing skills may be improved by practising these shots. The second feature allows the player to save good, or bad shots so that they can be replayed to prove to others your ability.

The five highest 'breaks' and the five longest runs of consecutive wins are stored for each game type and these are displayed in the opening titles and during game type selection.

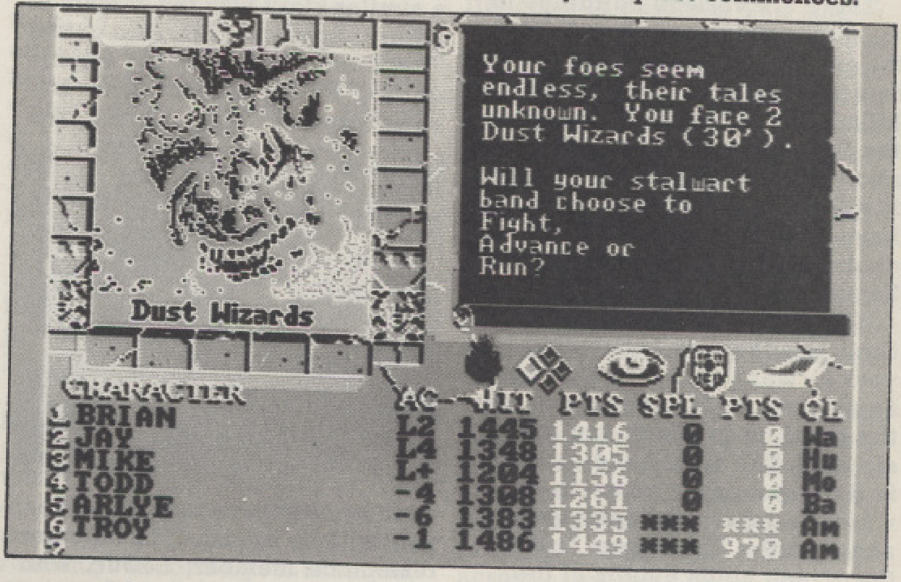
Finally, as if all this were not enough, the game also provides a customise feature. This allows games to be constructed that are different to those provided as standard.

The package consists of the game on a single 5-1/4" disk and a thirty page instruction booklet. It has obviously been written for the American market but this only adds to the enjoyment of the game.

Graphics	*90%*
Sound	*70%*
Playability	*90%*
Overall	*85%*
Price	*£24.95*

Bards Tale II — The Destiny Knight

This game, also from Electronic Arts, is a sequel to the successful original Bards Tale and contains much of the flavour of that game.



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Your foes seem
endless, their tales
unknown. You face 2
Dust Wizards (30').

Will your stalwart
band choose to
Fight,
Advance or
Run?
```

```
CHARACTER    AC  HIT  PTS  SPL  PTS  CL
1 BRIAN      L2  1445 1416    0    0 Wa
2 JAY        L4  1348 1305    0    0 Hu
3 MIKE       L+  1204 1156    0    0 Mo
4 TODD       -4  1308 1261    0    0 Ba
5 ARLYE      -6  1383 1335  ***  *** Am
6 TROY       -1  1486 1449  ***  970 Am
```

The game revolves around the quest to relieve the city of Tangramayne and the Realm, from lawless mercenaries that have invaded from the Lestradae kingdom. The mercenaries are guided by an evil Archmage called Lagoth Zanta. During the invasion the mercenaries have captured the Destiny Wand which has been used in the past to summon armies to defend The Realm. Your mentor, Saradon, has been able to find out little about Lagoth except that the Destiny Wand has been broken and lies in seven pieces, each of which lies in a different location. Each location is known as a Snare of Death and the puzzle there must be overcome to obtain the fragment. The quest therefore is to recover the Wand and save the city of Tangramayne and the Realm itself.

The first job that must be done is to assemble a band of Adventurers and these are recruited from the Adventures' Guild in Tangramayne, the place where your quest commences.

> ***"Here a character called the Sage is to be found" and he will provide important information on finding each piece of the Wand."***

Saradon has provided a manual, including a map of the Tangramayne, which will help you throughout the quest.

If you are an experienced Bard, your character can be transferred from the original game. In addition characters can be transferred from the Ultima III quest. However, if you are a beginner your character's level will be quite low. To help you increase the level, Tangramayne has a Starter Dungeon in which you can gain experience points.

Once this has been done you can leave the city and enter the wilderness. Here a character called the Sage is to be found and he will provide important information on finding each piece of the Wand. It is recommended that you visit him after obtaining each piece and a hint on the first question to ask is also provided.

The game includes the usual level of monsters and warlocks with various levels of strength and ability for each one. Some monsters and characters must be fought and the game contains a combat element. Weapons can be used, but a general melee by all your band is possible if none are available.

Again, as usual, items must be collected and gold is often the reward for killing an enemy. To save carrying all the gold around, banks are available in the cities. These banks offer no interest but will not be robbed or go bankrupt.

There are various buildings in the game which may be useful if the condition of your band deteriorates. If characters are killed along the way a visit to the Adventurers' guild will allow you to recruit more; there is a Guild in every city. If you have the gold, injured or dead characters can be revived in the Temple.

The screen display shows three windows, on the top left is your forward view, and this can be either your foes, the street or the building in which you are situated. The right hand corner is the command window in which to enter your decisions about battle. The bottom half of the screen holds details of the status of your band. Movement around the city or wilderness can be made by use of the joystick, mouse or keyboard.

The package is simple to play and will please the ardent adventurer. It would also make a good starting point for those not familiar with adventure and role playing games. The program is supplied on two 5-1/4" disks and comes with a thirty page manual.

L.K.

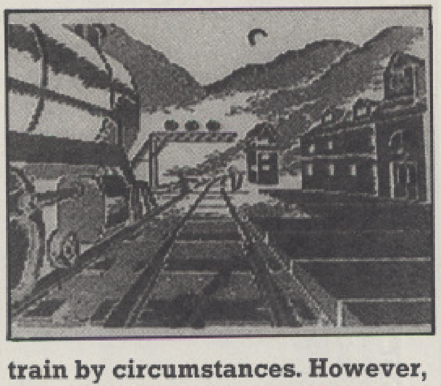
Graphics	60%
Sound	55%
Playability	60%
Overall	60%
Price	£24.95

The Train

The Train is an Accolade production that revolves around a second world war mission to rescue Art treasures. The treasures are being transported back to Germany by the Nazi's and have already been loaded onto a train which is heavily guarded in the sidings at Metz. Your mission is to capture the train and drive it to the French coastal town of Riviere to hand the treasures over to the advancing allies.

> ***"Your mission is to capture the train and drive it to the French coastal town of Riviere to hand the treasures over to the advancing allies."***

This may all sound familiar, as a similar story was the subject of a Burt Lancaster film, also called The Train. You, play the engine driver, Pierre LeFeu, who has been pressed into driving the train by circumstances. However, you will be assisted by another resistance member, LeDuc, who does have some experience of train driving.



The first part of the game is to capture the train and set the points so that you can leave the goods yard. To do this you must try to keep the German guards undercover while LeDuc dashes to the signalbox to reset the signals. Once this is done, and the level of game you are going to play selected, the view transfers to the cab of the engine. Each of the controls, Break, Throttle, Steam blow off etc, are controlled by use of the joystick or cursor keys and this includes the shoveling of coal, as and when required. Hints will be provided as to what to do next by LeDuc and the other members of the Resistance on board. Three other views are possible, the front and rear gunners and a map showing your current location.

As you progress through the French countryside you will need to cross river bridges and go through Stations. One of the stations is Nancy, the birthplace of that famous Resistance fighter Rene Artois. Both the Station and the bridges pose different problems.

> ***"One of the stations is Nancy, the birthplace of that famous Resistance fighter Rene Artois."***

The choice of routes to Riviere is up to you but it should be remembered that both you and the Germans do not want to destroy the track. They need it to retreat and the Allies need it to advance.

The screen displays are adequate, if not extensive, and the game is similar to Ace of Aces in its playing style. It feels very much like a mix of the above mentioned game and the Brighton Belle, a star of the C64 game library, but the train is not as difficult to drive. As well as the instruction book a map of the lines between Metz and Riviere is also provided. If you like trains, with a bit of shoot'em up on the side, this is the game for you.

L.K.

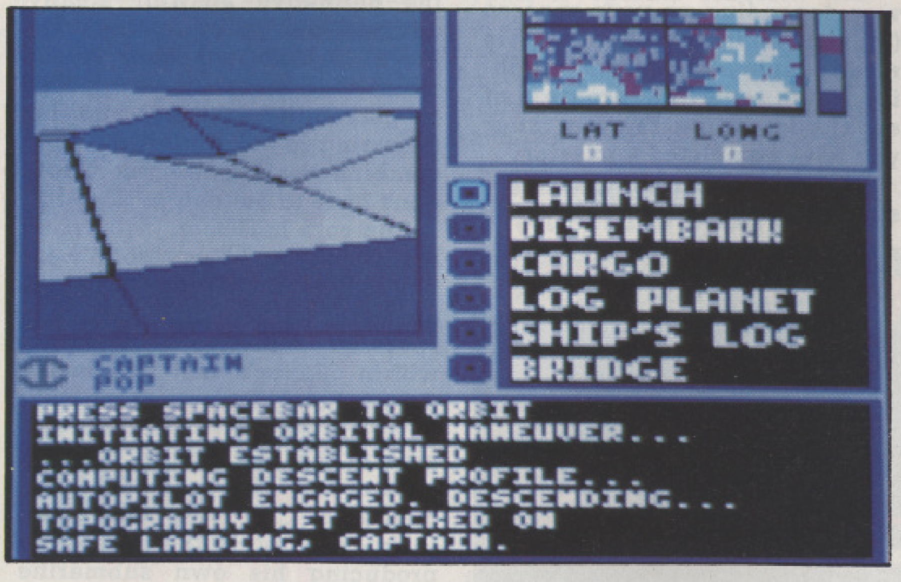
Graphics	75%
Sound	65%
Playability	70%
Overall	70%
Price	£24.95

Starflight

Electronic Arts

To their credit Electronic Arts and Binary Systems have upgraded the graphics in this 1986 release to allow for EGA and have removed all of the remaining bugs. It may be old,

PC Games



```
PRESS SPACEBAR TO ORBIT
INITIATING ORBITAL MANEUVER...
...ORBIT ESTABLISHED
COMPUTING DESCENT PROFILE...
AUTOPILOT ENGAGED. DESCENDING...
TOPOGRAPHY NET LOCKED ON
SAFE LANDING, CAPTAIN.
```

but Starflight remains one of the most playable games ever to grace the screen of your PC. A bold statement, I know, but a well deserved one. With 1.5 Megabytes of code, Starflight is a cross between Elite and Captain Blood, yet it manages to compare very favourably with both. You start the game from Starport, your base, which is the centre of all operations. There are a variety of locations to visit. Selection of the required one is done by moving a small astronaut figure to different areas of the station (try doing nothing for a while and the little man, hands on hips, begins to tap his foot in impatience). Your first task is to select a crew to man (or rather 'thing') your spaceship. You may select your crew from a range of different races, who all have their own unique characteristics, for the posts of Captain, Science Officer, Navigator, Communications Officer, Engineer and Doctor.

> *"You start the game from Starport, your base, which is the centre of all operations."*

After each member of the crew is assigned to their post you have the option to train them to enhance their skills. An important task as the skill level has an affect on the gameplay. There is a Ship Configuration centre where you can outfit your vessel. A Bank is available, with a variable rate of intrest, for the savers amongst you. Then there is the Trade Depot where you may buy and sell objects. This section includes an analysis feature, similar to The Bards Tale, where unknown objects, found on foreign soil, may be identified - for a price.

Operations holds a notice board. Notices form an important part of the game because although Starflight appears, at first glance, to be just a decent trading game you will realise that, after reading incoming messages, there is more to it than first meets the eye. The notice board informs you of news from around the galaxy. The full consequences of many of the messages may not be realised initially. What is realised, however, is that the sun has been growing rather unstable lately. Originally thought to be the result of natural processes the instability appears to be the result of alien workings. So what's going on? Maybe you can find out during your travels. However, during your travels you must keep an eye open for any prospectively habitable planets as your home planet is taking the precaution of total evacuation in case the sun becomes a threat to the whole solar system.

You may examine a planet via your Science Officer who gives you all the facts and figures. Then you can, if the gravity is not too strong, land on it. After selecting a site you home in onto the planet surface. A typographical net is then thrown over the selected area after which a view to the planet surface can be seen through a screen window. You then have the option of exploring the planet surface in a terrain vehicle. Possible finds may include minerals to mine, life-forms to investigate, ruins to explore and a variety of objects to collect which may give you useful clues to your quest or may just provide necessary income to improve your ship's configuration and fuel stock.

Contact with other, intelligent lifeforms is possible. You can, in true Star Trek style, hail them via your Communications Officer and then strike up a conversation. Further information or supplies may be forthcoming. However, some aliens are throughly nasty pieces of work and, after insulting you profusely, will attempt to blow you to kingdom come - so beware. This is an excellent sequence which includes on-screen portraits of the aliens you are talking to.

Starflight is totally engrossing. The 270 star systems containing 800 planets (most of which you can land on) will keep you busy while you chat to any of the seven different races you may come across. However, it is the plot which will keep you playing for hours on end. The only drawback I can see is the lack of gloss, such as in the graphics department. However, for a game of its age, Starflight still has an excellent presentation.

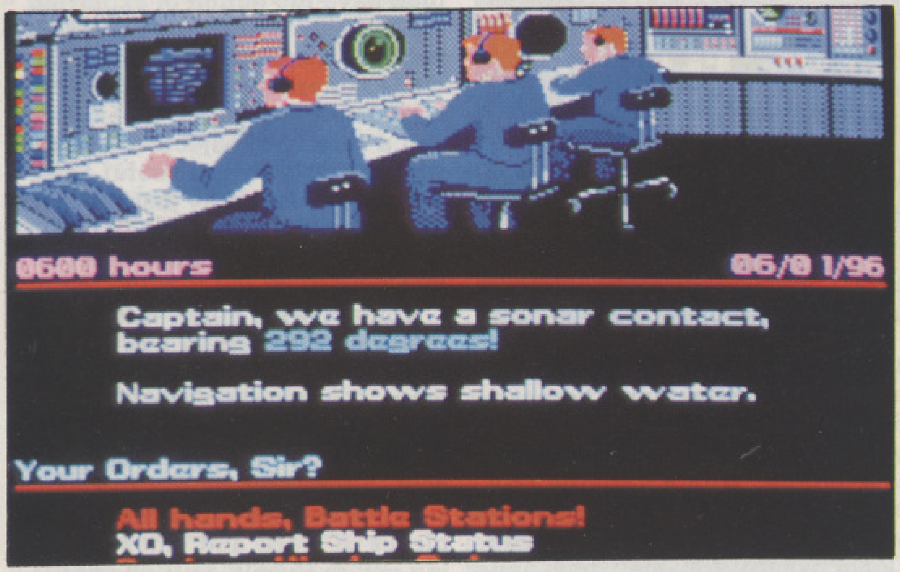
P.R.

Grapics: 78%
Sound: 30%
Playability: 90%
Overall: 89%
Price: £24.95

RED STORM RISING

MICROPROSE

Microprose's Red Storm Rising (RSR), C64 version, was reviewed in the November 1988 issue of *CCI*. The second version of this simulation of modern submarine warfare has now appeared for the PC. This particular version plays far more smoothly as there are less disk swaps (none for hard disk users), faster disk access and improved graphics (in EGA and VGA modes). However, sound facilities on the PC are nothing to shout about unless you have access to the Innovation Sound Board or the Ad Lib Sound Board. The latter pertain more to the US market so they can largely be ignored. The package arrives complete with 108-page manual, two 5 1/4 inch disks and a keyboard overlay for both normal and extended keyboards and a PC specific leaflet. New features for the PC version include an 'accelerated time' facility to speed the game up.



0600 hours 06/01/96

Captain, we have a sonar contact, bearing 292 degrees!

Navigation shows shallow water.

Your Orders, Sir?

All hands, Battle Stations!
XO, Report Ship Status

As with other Microprose simulations, RSR depends upon battle scenarios using a variety of submarines of different qualities with promotions and medals for the lucky and the skillful. However, RSR has an important addition — the large wargame scenario which places you firmly in the middle of World War 3. While the NATO and WARSAW PACT forces battle it out, you are assigned missions which could swing the tide of the war either way depending on your success (or lack of it). Excellent use is made of animated text and graphics which report the progress of each side during the war after you have completed a mission.

RSR is certainly a detailed simulation and neither this or the previous review has been able to cover its large array of features. Unlike Silent Service, RSR provides the player with relatively fast action. Silent Service involved the player in long sweeps of the ocean with nothing much happening. RSR uses modern sensor equipment (satellites, etc) to pinpoint enemy vessels, thus improving the targetting rate. Comparing RSR with Electronic Arts' 688 Attack Sub is a more difficult task. On graphic quality 688 wins but 688 does not have RSR's storyline graphics or, more importantly, the wargame feature. However, 688 does have a more varied mission listing, including inland missions for cruise missiles. Then again, RSR has a better set of documentation. So which to buy? Both! Each game has its own advantages. You will be well served by either.

So much for the game. But what about the personalities behind it. Tom Clancy (author of the original book) and Sid Meier (Microprose's ace game designer) aired their views during a recent Winter Consumer Electronics Show in the USA. One of the most asked questions about RSR was to what extent, if any, was Tom Clancy involved. Tom was able to give the definative answer, 'Really, advice. I don't provide any code. I'm a user, not a hacker. I look mainly for accuracy as opposed to playability, per se, and his (referring to Sid Meier) job is to combine the two. Thank God I don't have to do that.'

Rumours had been circulating that Clancy and Larry Bond were 'invited' to the White House to answer charges that they had revealed sensitive information within Clancy's last two books (Larry Bond, as an active duty naval officer, gave valuable advice to the Microprose team as well as providing technical information for Clancy's novels. Bond is, by-the-way, in the process of producing his own submarine strategy game called 'Harpoon'. It promises to be a good'un too. More news when it happens - as they say). All Clancy had to say to the allegation was,

'False. Completely untrue!'

So how did Sid Meier work with Larry and Tom? Meier explained, 'There are things that Tom knows from the player's point of view, of how things really work. Such specific things as the range is too great, here, or 'I should be able to hear him before he can hear me.' Kind of the Captain's perspective. On the technical side, we get most of the data from Larry. Yet, the major difference, I think, between a computer game and a board game is the look and feel. In a computer game you need to get the 'feel' right. The interaction is much more integral to a computer game as opposed to a board game. In a board game you don't have that need for a critical feel for timing and sequence that are critical to a computer game and Tom helps us with that in this game. He knows what happens because he knows and talks to

> *"Yet, the major difference, I think, between a computer game and a board game is the look and feel."*

those people, and has been on board submarines as well.'

Clarifying that last point Clancy added, 'The things I left out in 'Red October,' I included in 'Red Storm'. For example, submarines are always cold, because they have nuclear powered air conditioning, and they smell like the inside of '3-in-1' oil'.

P.R.

Graphics: 81%
Sound: 30%
Playability: 93%
Overall: 93%
Price: £34.99

LEGACY OF THE ANCIENTS

ELECTRONIC ARTS

Funny people, the Ancients; into Museums, you know. In fact, it is said that they built their first museum over 50,000 generations ago and haven't stopped building them since. It's similar, in many ways, to NCP Car Parks. Although, if you happen to walk into one, a museum that is, it is doubtful that you will find the usual cacophany of exhibits: Dodo eggs; Dinasaurs or ZX81s. What you *will* find are...ARE...erm, well, windows. Exciting, eh? Actually the windows you find, strolling through the 3-D graphic corridors, can hold secrets or maybe form gateways to another time, another place, another NCP Car Park!

You have a mission. Destroy or neutralise the leather scroll that you have become awfully attached to recently. If you fail... well, need we talk about such things? Anyway, the scroll cannot be cut, burnt and so on. It houses immense power, evil power - naturally. To find the means of destroying the scroll you must travel to distant lands, on different worlds, through time and space. Entry through the museum windows is achieved via payment of a variety of coins. You begin the quest with two jade coins. However, you will need many more coins, of various types, to operate different windows. While some windows allow access to different worlds others bestow mini-quests which will, ultimately, further your cause (and provide much needed coins)

> ***"When your character icon settles upon a city icon you have the option of entering that city"***

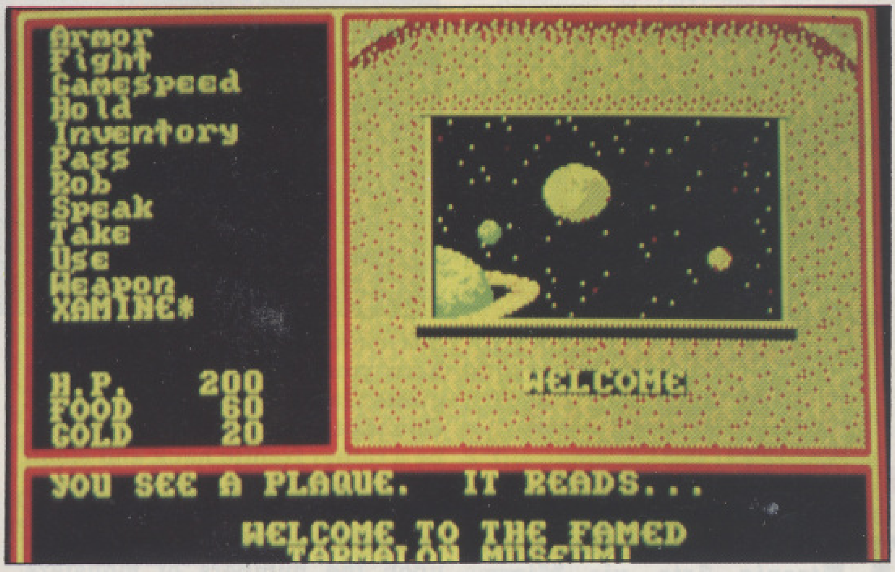
Although the museum is navigated in 3-D graphic form the action changes to an overhead Ultima-type when you enter a new land through a museum window. Your character is represented by a crudely animated stick figure who travels over the continent or, via boat, various oceans. When your character icon settles upon a city icon you have the option of entering that city. The screen then shows a close-up of the city complete with a variety of buildings and inhabitants. On entering a building the roof dissapears to reveal the interior. Moving up to a counter and speaking to the proprietor will bring a relevant response. He may be selling or buying provisions, such as Armour, Weapons and Food, or he may offer to tell your fortune (a good source of clues), provide a Banking facility, offer to loan you money or provide Gambling facilities. The latter comes in five forms including, for example, Blackjack.

The Programming Team ...

Chuck and John Dougherty, twin brothers no-less, have very different backgrounds. Chuck studied psychology at Michigan University and, soon after took the subject seriously leading him into a career as a psychologist. John, however, took his Master's Degree to Bell Labs were he obtained work. Years afterwards the twins realised that they could use their interest in computer adventures in a positive manner. So they decided to create their own system. In addition to Legacy of the Ancients the twins have created Questron 1 & 2 for SSI.

Entering selected areas, such as the Dungeon, changes the display back into a 3-D display. There are 24 Dungeon levels in all with 12 different monsters within them, 32 outside in the wilderness. Attributes, such as the range of magic, weapons and so on are restrained. Graphics are adequate in Legacy, they lack that certain crispness in the 3-D areas while all of the graphics would have benefitted from greater attention to detail. You get the feeling that the conversion was rather half-hearted.

After encountering the totally novel, and potentially exciting, museum and its use as the base to a variety of worlds, you become



YOU SEE A PLAQUE. IT READS...
WELCOME TO THE FAMED
TARMALON MUSEUM!

PC Games

rather let down once you grow familiar with the game system. As can be expected from the authors of the Questron series, they have used the same system throughout all of their RPGs. This is a bad move. The encounters, for example are totally random and much too frequent. Monsters pop up beside you with amazing regularity. There is, on few occasions, some indication that something is approaching from a general direction but this warning does not help matters at all. The combat system is too simplistic, just a matter of keeping your finger on the 'fight' button or running. Finally, the puzzles could have been improved. The general scenario promised much but, in the end, Legacy will only be of interest to beginners. Everyone else should avoid it.

P.R.

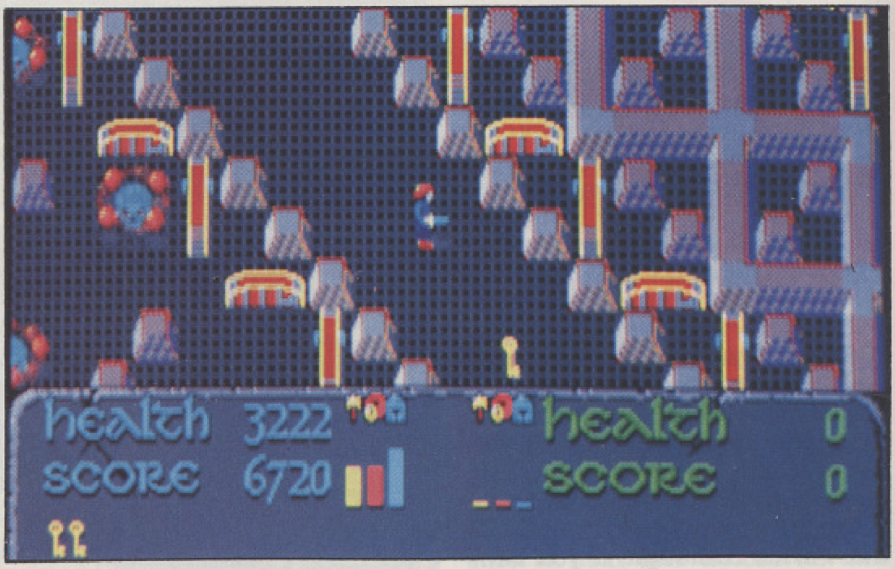
Graphics: 55%
Sound: 20%
Playability: 40%
Overall: 42%
Price: £9.99

DEMON STALKERS

ELECTRONIC ARTS

Demon Stalkers from Electronic Arts, via Micro Forte, pits the stalwart PC owner against those familiar mazes made popular by Gauntlet that everyone has grown to know and love. You must enter the depths of what is now known as Doomfane to brave the perils in a quest to rid the Vaults of the hated Calvrak, while sifting through a treasure chest, or two, on the way. Demon Stalkers arrives in one of those horrid disk-size boxes Electronic Arts are now, thankfully, phasing out. The manual occupies the box with a Command Summary Card and the anti-piracy codewheel known as 'Arthur's Magical Cypher'. The latter fell apart in around two hours.

The game can be played solo or as a two player team. Setting up your character is rather basic. You may adopt one of two character icons. There is no difference between them. No professions or any character statistics are available which is a pity. Micro Forte have lost the chance to warm up the audience by allowing the player to identify with their character. Playing Demon Stalkers you notice a difference in gameplay from the original Gauntlet. The latter appeared to be a rather frantic hack and slash with hundreds of monsters swarming towards you. Demon Stalkers definitely cuts down upon the numbers of monsters making Gauntlet an all action game and Demon Stalkers a search game with action thrown in.



Spicing up the quest is Arthur's legacy of messages, scrolls and a few surprises. When scrolls are found they may be used as weapons or they may contain messages from Arthur and his team. The messages may provide a clue on how to complete a level, advice on dealing with the enemy and so on. In addition, before certain levels are attempted, a portion of scroll will appear on-screen telling how Arthur was progressing at that particular stage. Further hints and advice may be gleaned from these writings. At the end of the scroll a question will appear that will, if answered correctly, lead to a health bonus or similar. In addition, Arthur has left certain useful weapons lying in hidden places ready for the player to discover during the quest.

Graphics are just bearable on CGA but they come to life in EGA looking very presentable. Monsters, while being somewhat few in variety, are fairly well-drawn. Sound, for a PC, is pretty good with valiant attempts made in all departments. Each level is well thought out with a specific task needed to pass onto the next level. Examples include finding all the scrolls or moving through the maze in a particular fashion. Some level puzzles are interconnected having linked puzzles between levels.

Demon Stalkers is a good effort at a Gauntlet-clone providing enough individuality to set it apart from the classic original, while the addition of the construction set editor certainly makes it value for money.

P.R.

Graphics: 76%
Sound: 45%
Playability: 71%
Overall: 70%
Price: £19.99

HORGAN'S HINTS

No maps this month, but gallons of pokes for some of the toughest games around, including Phobia, Red Heat and Dominator among others for the 64, and a screen designer for the Plus 4 version of Terra Cognita. Goodies are on their way to Steven Bell and Casey Gallacher for their much appreciated efforts.

64

Phobia

Load and reset, then enter:
POKE 5390,189
SYS 2172
To see the end, reset and restart with:
SYS 2497

Star Wars

The following procedure doesn't give infinite lives, but makes the game a lot more playable. Start to load the game, and hit RUN/STOP and RESTORE as the screen goes black just before the loading picture appears (around tape count 34). Stop the tape and rewind it about one unit on the counter. Now enter:
POKE 20095,173
POKE 20227,173
POKE 34945,173
POKE 35156,173
POKE 37074,173
POKE 37260,173
POKE 46509,173
SYS 4112:RUN
Then press play on the tape and load the rest of the game.

Bombo

Reset and enter the following for infinite lives:
POKE 11417,173
SYS 387

Red Heat

An infinite energy supply would be more helpful, but this will do for now. No restart address for this one (yet), so it's for hack carts only.
POKE 3108,165 (infinite lives)

Wonderboy

Here are a couple of pointless pokes from Casey Gallacher. Load and reset the game before entering them.
POKE 4170,234
POKE 4171,234
POKE 4172,234
SYS 2128
That splits the head from the body.
POKE 4070,234
POKE 4071,234
POKE 4072,234
SYS 2128
That one replaces Wonderboy with a letter "A".

Robocop

If you found the poke in the June issue corrupted the game, try these built-in cheats. On the title screen, type **SUEDEHEAD** (or try without that second E if it doesn't work) to load the next level. Do the same with **DISAPPOINTED** to load the last level. Thanks to "T.A.W." for that.

Dominator

Here are the pokes from the June issue, this time with restart instructions. Load and reset before entering:
POKE 2215,234:POKE 2216,234 (infinite lives)
POKE 2542,0 (steer on all levels)
POKE 4499,2 (extra speed)
SYS 2117
The screen will look a mess, so reset again and re-enter the SYS call. If you fancy a rendition of the game's music, reset the game and enter the following listing.

```
10 REM **DEWAR**
20 POKE 49152,3
30 SYS 49152
40 FOR T=0 TO 7:NEXT T
50 RUN 30
```

The 3 in line 20 can be changed to 1 for the in-game music or 4 for the game over piece. Change the tempo by editing the 7 in line 40. David Dewar was the brains behind that lot.

Pro Skateboard Simulator

I couldn't get this to work properly on my 128D, but you may as well give it a bash. Just reset after loading to reveal a hidden bonus game!

BMX Kidz

Either use the built-in cheat (type VIVALDI on the main title screen followed by a key from A to F to select the level) or try these pokes:
POKE 9004,234 (to freeze the timer)
POKE 12354,6:POKE 12355,2 (to change the background colours)
SYS 8192 (restarts the game)

Fruit Machine Simulator

For an endless supply of credits, reset and enter the following:
POKE 33615,173
SYS 32768
Then reset and enter the SYS call again, otherwise the game crashes.

Plus 4

Terra Cognita

Now this is a bit more creative than your average infinite lives poke. With clever use of the monitor, Steven Bell has come up with this handy screen designer. Here's how it works:

1. Load the game and enter the monitor
2. Between M 1400 and M 1FF8, change any two digit number/letter to:

10 (fuel) AA (pink squares)
22 (extra lives) BB ("1" squares)
33 (start again) CC (purple squares)
44 (bonus) DD (decelerate)
55 (shield) EE (flashing blocks)
66 (green background) FF (blue squares)
77 (red background) 88 (blue background)
99 (accelerate)

3. Type **G 2000** to start the game
4. To save your designer screens:
S "file name",8,1400,1FF8 (disk)
S "file name",1,1400,1FF8 (tape)
5. To load the designs back in again, first load the game, then your designs with:
L "file name",8,1400,1FF8 (disk)
L "file name",1,1400,1FF8 (tape)

That wraps it up from me. Steven Bell's screen designer is an excellent idea, but can any of you top it? There are plenty of freebies waiting for anyone who can. Get your ideas to me at this address:

Uncle Horgan
Hospitable Horgan's Hints
CCI
40 Bowling Green Lane
London
EC1R ONE

Adventure

BY ANDY MOSS

HELLO HEARTY ADVENTURERS ONE AND ALL. YOUR HERO IS BACK AGAIN WITH MORE CCI ADVENTURE CHRONICLES, AND THIS MONTH'S EDITION IS SIMPLY PACKED WITH REVIEWS FROM A BUMPER CROP OF NEW RELEASES.

COMMENT

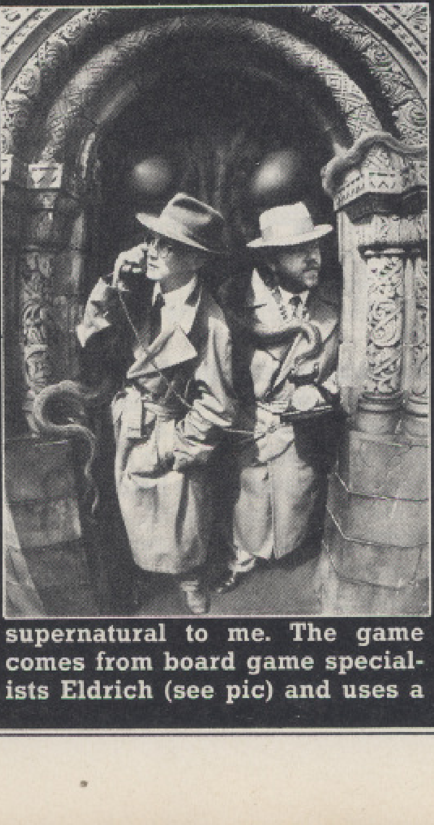
If someome had said to me last year that come the middle of Summer, I would be snowed under with new adventures to review, I would have laughed out loud! No one releases any good software in the Summmer. This season is the dumping ground for all the dross that you get stuck with throughout the year. WRONG! This month I have been swamped with new material, most of which is good exciting stuff I am pleased to say... INFOCOM'S ZORK ZERO makes an appearance at last, I comment on HILLSFAR from US GOLD/TSR (reviewed in last month's issue), JOURNEY TO THE CENTRE OF THE EARTH, SIERRAS' GOLD RUSH, and PERSONAL NIGHTMARE from Adventuresoft make up the rest of the pack. Not bad for a month's work, eh? But first things first, and with the month of September upon us, my thoughts naturally start to drift towards the impending PC show. For some, it is the highlight of the computer year, for others it is four days of weary footslogging around Earls Court bumping into people you didn't want to meet again.

My own frustration of the Show, is that so much is promised for 'later next year' and rarely do you come across an imminent adventure. We are shown screen shots, videos, box artwork, instruction manuals and are granted an 'in depth interview' with the programmer, but a look at the actual program?...... forget it chum. If you are going this year, check out what I have said, and see if I am wrong.

ADVENTURE NEWSDESK

NEW RPG FROM ELECTRONIC ARTS

The Hound Of The Shadow is the title of a new role playing adventure from EA, that smells of the supernatural to me. The game comes from board game specialists Eldrich (see pic) and uses a new system entitled Timeline. It enables the player to save the character and all the skills and experience that has been gained for use in further adventures from the company. As well as choosing the nationality and sex of your character, you also get six professions and up to 50 different skills to think about. The adventure is set in the roaring 20's and months of research has apparently gone into making the plot historically accurate. Using sepia type graphics, the game has you discovering odious horrors lurking beneath the seemingly normal life of 1920 England. It's a game of detective investigation and clue unravelling and is expected out any time now.



SMART EGG GO FOR RPG

Still in the RPG theme, I was on the phone to Nigel Brooks head of Smart Egg, who brought us Rigel's Revenge, The Golden Eggcup and Serf's Tale, and he was telling me that they are putting the finishing touches to an RPG sytem that has to be 'seen to be believed'. A through the eyes type approach including combat which has speed, sound and strategy. By the way, they don't just write adventures. Nigel told me that they have developed different machine versions of Micropose Soccer, Codemasters Soccer, CRL's Federation and Virgins Time Soldier. They are a busy lot.

TANGLED TALES FROM MICROPROSE

Origin are busy creating Tangled

Tales, an RPG adventure that concentrates on puzzle solving rather than spending 80% of your time travelling around searching for a princess or a wand. You play a struggling wizard's apprentice who is given three progressively difficult tasks in order to become a real wiz. Starting with no magical powers at all, you slowly build your quantity of potions and spells by solving problems along the way. Dungeons, castles, haunted houses and different characters all play their part in an adventure that is billed as 'pioneering and entertaining'. We shall see.

BROADSYSTEM LAUNCHES PHONEQUEST

Broadsystem, one of the UK's largest telephone publishing companies, has joined forces with adventure author Joe (Lone Wolf) Dever to produce The Fortress Of Doom, the first in a series of Phone quests. Based on the Lone Wolf adventure gamebooks, the system allows you to ring in and sample the latest in voice interactive real time adventure playing. The set up is similar to the CASTLE MAMMON adventure that I described in these pages a few issues back. The telephone number for getting into the game is (0898) 300341. Try it out for yourself.

HOTLINE CHANGE AT ACTIVISION

Julie Barwick has been sent screaming from Activision's offices due to the amount of calls she has had to process on the Hot Line. Another brave lass by the name of Joanne Byford has taken her place and can be reached on the same number (0734) 310003

POPULOUS DATA DISKS ARE HERE.

If you have finished that great game Populous fear not, for more scenarios are now available. Five new worlds, Revolution Francais, Silly Land, Block Land , Wild West Land and Samurai Land are all completely new graphically and strategy wise, so you can play God for a while longer.

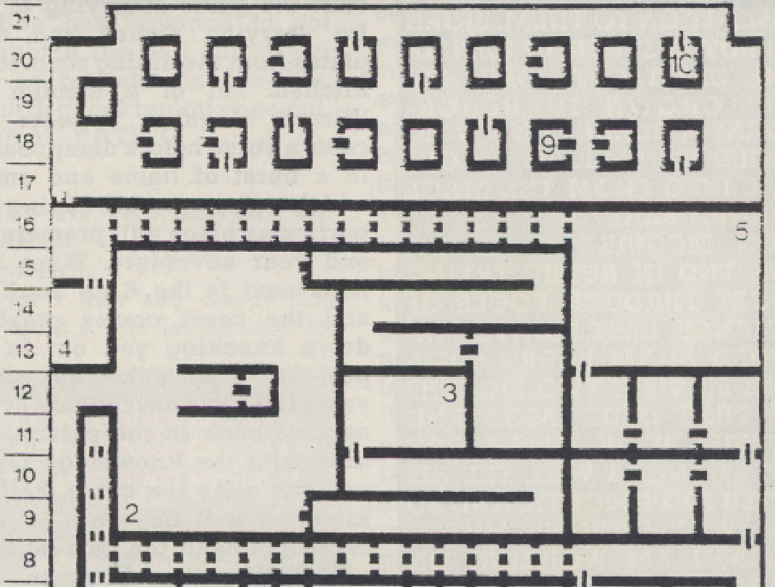
BARDS TALE II SOLUTION CONTINUED

REMEMBER LAST MONTH? THE PARTY HAD TRAVELLED THE WILDERNESS IN SEARCH OF THE CITY OF EPHESUS. THIS MONTH WE HAVE ARRIVED THERE, AND FACE THE TOMBS....

THE TOMBS LEVEL ONE.

After reaching Ephesus and locating the entrance to the Tombs, we descended into a realm unfit for the living. 1) Proceeding north we found ourselves in a large room filled with spinner traps. 2) We kept our bearings by hugging the western and southern walls, and eventually came to a door in the south eastern corner of the spinner room which led into a long switch back corridor. Opening the north door at the end we entered a large chamber that held a teleport trap in the NE corner (3). 4) Teleported to a smaller chamber, we exited through a door NE only to enter another chamber the same size. Following our noses, we finally came to a room of darkness (5). Andreas detected many traps here, and we kept close to the north wall, then down the east wall halfway along the south wall, then out into the centre of the room and south again to a door in the SW corner. We were overjoyed to have escaped the traps and all shook Andreas' hand, who typically shrug it off as just 'a lucky break'.

We travelled East and then south through three more chambers, until we emerged at the junction of two corridors. Heading down the southern corridor, the party came to a dead end, but we found a poem carved on the wall. 'THE SNARE OF DEATH SPINS RIGHT IN WHOLE, AS FIRE-ONES FEAST ON THE DEADMAN'S SOUL. YET SAVAGE WORDS CAN CUT THE ROCK AND FEATHERS SPLIT THE HEAD-



THE TOMBS, LEVEL ONE

MAN'S BLOCK.' What does it all mean?

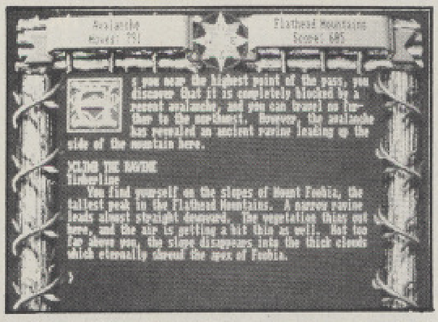
We returned to the westerly corridor and came to two doors. We continued west to the end and turned south, then east into a chamber that held six small rooms (7). We entered room (8) and a voice said, 'After the toxic one check yourselves for a thing that appears common. More mysteries. We returned to the teleport room (7) and find ourselves in (9) moving along to (10) where we found teleportation magic and a message; THINGS CHANGE UNNOTICED AND NOT ALWAYS FOR THE BETTER. Andreas cast a Scry Site spell and we found we had descended a level............TO BE CONTINUED.

JUST SPACE BEFORE THE MEGA REVIEWS FOR SOME MENTION OF YOUR LETTERS THIS MONTH. MY THANKS TO PHIL DOWNEY FOR HIS LETTER ABOUT THE INTERCEPTOR ADVENTURES FOR SALE, I HAVE PASSED IT ON TO THEM. BJORN GUILLOT IS STUCK IN ULTIMA V, HE CAN'T GET LORD BRITISH' CROWN IN BLACKTHORNS PALACE, AND WHO SHOULD HE TALK TO TO GET SOME INFO FROM THE MAGE IN SKARA BRAE?
JASON MCGUIRE IS AT HIS WIT'S END IN AUSSIE TRYING TO GET THROUGH POOLS OF RADIANCE. LAST MONTH I INCLUDED ADAM BARR'S SOLUTIONS SO WAIT TWO MONTHS FOR THAT ISSUE JASON AND YOU WILL BE OK. MIKE LEWIN FROM CANADA WILL SEE HIS LETTER NEXT MONTH, AND SO WILL W. T DUNLOP. MISS C DOLAN, I AM WORKING ON YOUR PRESIDENT IS MISSING PROBLEM AND WILL REPORT BACK HERE ASAP.

ADVENTURE REVIEWS

ZORK ZERO
INFOCOM (see pics)

Just lately Infocom have surpassed themselves. What with Journey my all time favourite, Shogun, Beyond Zork and now Zork Zero they are more than satisfying the demands from their faithful followers. Yes they are now into graphics, and yes the on screen hints are still there, but make no mistake, the writing skills and humour from the time honoured team are still there in abundance. This latest chapter of Zork takes us even further back to before the Great Underground Empire collapsed, and answers some questions about just why things went the way they did. The Empire is in its heyday, upmarket penthouse flats crowd the massive caverns, and no adventurer has yet set foot in the open field west of the White House. You are a humble servant in the court of the Royal Flathead Palace, and start the game scurrying to and fro carrying dishes and dirty plates from the dining room to the kitchen. All of a sudden the Wizard Megaboz appears and casts a curse before disappearing in a burst of flame and smoke which unless you are hiding in a particular place will prematurely end your adventure. What happens next is the King snuffs it, and the court comes crashing down knocking you out in the process. You wake up ninety years later as a descendant of that servant back in the palace, this time with the knowledge that if you can allay the curse, half the kingdom will be yours so says Wurb Flathead the current ruler of Flatheadia. Looters and previous adventurers have now all departed emptyhanded, and your only company is a court jester who spins riddles and makes you play games that all have a means to an end. He will help and hinder your progress through an adventure that is both descriptive and witty. The graphical content in ZORK ZERO is less about pretty pictures of locations and more about games which are puzzles in themselves. What about a few hands of Double Fanucci for instance, (no instructions here except it is a cross between bridge, poker and anything else you care to mention). The on screen mapping is very pretty, and only can be accessed once you have visited the location concerned. Your quest will take you to every corner of the Empire as you seek out objects ranging from the absurd to the sublime. As usual the in package trinkets are included, a calendar (Zorkian of course) a blue print of the caves, and a bit of parchment with a message on it. Can you overturn the curse? You may not, but at least you'll have fun trying.



Avalanche
Moves: 791

Flathead Mountains
Score: 685

As you near the highest point of the pass, you discover that it is completely blocked by a recent avalanche, and you can travel no further to the northeast. However, the avalanche has revealed an ancient ravine leading up the side of the mountain here.

CLIMB THE RAVINE
Timberline
You find yourself on the slopes of Mount Foobia, the tallest peak in the Flathead Mountains. A narrow ravine leads almost straight downward. The vegetation thins out here, and the air is getting a bit thin as well. Not too far above you, the slope disappears into the thick clouds which eternally shroud the apex of Foobia.

>

PERSONAL RATING 9

GOLD RUSH
SIERRA/ACTIVISION AMIGA

Yesssirree folks, them pesky varmits done gone and got all historical on us, and treated us to a slice of good ol American pioneering. A lot of a woopin and a hoolerin an what does it get you? A sorry tale of prospectin' way out west when the only law was a six gun, a pack of mules, and yer' best girl by your side. Yes siree Bob the gold rush was what done it, folks just got crazy with all that talk of gold an' all, but it was plain stupid to just up tools and rush of west into unknown territory.

Enough of that crazy old varmit and let's get up to date. Gold Rush is Sierra's tribute to the pioneering days of the Wild West, when gold fever ate up just about every family in the East. They packed their bags and just left, without knowing quite what they were in for. Many perished along the way, and those that made it there found very little to make them rich. A few did strike it lucky, and they made the legend that inspired others to follow.

This adventure chronicles the travels of one Jerrod Wilson, a typical East Coast 'City Slicker' whose brother disappeared years ago, and who yearned to find out about what life was really like outside of Brooklyn Heights, the only home he had ever known.

So there you are, and the first thing is to explore the town, and quite a size it is. The park poses some problems, step on the grass and you lose points, even risking jail! The graphics are typical Sierra 3D with moving bits, horse drawn carriages, townsfolk etc. Visiting the post office gets you on your way with a telegram from your long lost brother! He is out West and by the flake of gold you find under the stamp, he has struck lucky. He wants you to go there as soon as possible, so after withdrawing your money from the bank, and getting a few vital objects hidden here and there, you book your journey. This is where the adventure splits, as you can choose three ways to travel, by ship risking disease and starvation, by stagecoach and wagon train risking the desert and indians, and thirdly via Central America through the jungle quicksand and snakes.

I found the actual travelling part very boring indeed, you just sit there looking at a white dot moving across a map of America while the computer throws up messages of 'congratulations, you have reached so and so'. The galling bit is I got two thirds of the way through one route only to find I had made a mistake right at the start, and died in the desert. After 3 hours play that was not fair! Not really one of Sierras most exciting adventures, colourful yes, historical yes, gripping ... no.
PERSONAL RATING..............6

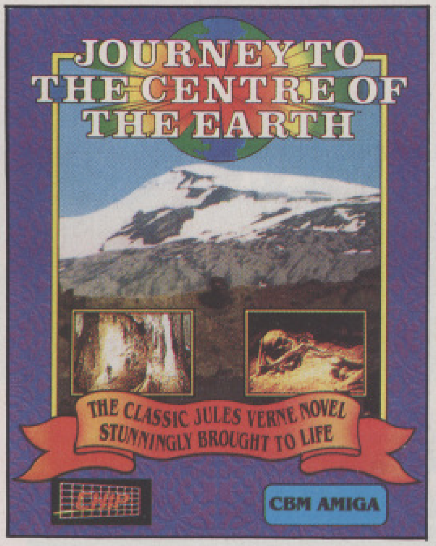
A PERSONAL NIGHTMARE
ADVENTURESOFT (through Tynesoft)

Mike Woodruff is the brains behind this project, which has been in development for over 18 months. Mike is best known for his work with Scott Adams and Adventure International. That is now defunct and Mike has turned his talents to creating something innovative. Let's just talk about the new system he has developed. AGOS allows you to see a story from wherever you happen to be at the time. For instance, at the start of the three disc NIGHTMARE, there is a hit and run accident, and if you are outside the pub when it happens you will witness the whole scene. The body, (which can be examined for clues) the police turning up, the ambulance arriving picking up the body and taking it away. If you are down the street you would just see the ambulance going past, and if you were in the pub, you would hear the screech of brakes, and see the police come into the pub to take notes. You see it all goes on whether you are present or not. Most of the game can be controlled by the mouse: pointing at doors opens them and key words are on screen for you to pull down. The game itself is very large, and boasts something like 500 sequences of animation. The plot is all about finding out what has happened to your parents who have mysteriously disappeared after writing to you asking you to come home. You have been booked into the Dog and Duck pub and it is there that you start the game. The secret of the game is to piece together by detective work just what is going on, alieviate the horror problems by solving the puzzles and take out all the bad guys who have taken over your village.

The more you play this game the more it grows on you; you appreciate all the little things that Mike has included to not only frighten the hell out of you but be as realistic as possible. Well worth checking this one out.
PERSONAL RATING 8

JOURNEY TO THE CENTRE OF THE EARTH
Rainbow Arts

Not a lot I can say about this except what a real let down it is.


JOURNEY TO THE CENTRE OF THE EARTH
THE CLASSIC JULES VERNE NOVEL STUNNINGLY BROUGHT TO LIFE
CBM AMIGA

Coming from the same team who gave us Joan Of Arc, this sorry tale is a recreation of Jules Vernes classic novel about one mans journey to the centre of the earth. Lots of pretty digitised graphics and sampled sound cover up a gameplay so shallow as to be almost non existant. Most of the incidents are random happenings and mostly just affect your health which is addressed by using your medical supplies which are of a limited supply. No sir, not a patch on Joan this one. Leave it well alone.
PERSONAL RATING...........3

HILLSFAR
US GOLD/SSI

Last month Paul Rigby reviewed this one but *CCI* thought all of you Adventrue fans might also like to hear what I thought of it. One note: CCI incorrectly gave Electronic Arts name as the contact. Well, we all make mistakes. As you well know, US Gold distributes this one. Ok, then, onto the review. The sequel to Pools Of Radiance, Hillsfar is a backward step in my view. More arcade sequences than actual Dand D exploring, it is as if SSI were caught in two minds wether to make it an arcade game or an adventure, and came up with both. After creating your character, or using a saved one from POOLS, you begin by travelling to the City of Hillsfar on horseback. This is an excuse for an arcade sequence of jumping over gates and fences, whilst possibly uncovering hidden paths. Arriving at Hillsfar, you then explore the city using first the through the eyes view ahead, and then once inside buildings a birds eye view of the proceedings. The game runs very fast for the 64 which is a plus factor, and the packaging is truly superb with a very colurful handbook and poster. Overall though not one for the complete adventurer, more one that dabbles around.
PERSONAL RATING............5

ONCE AGAIN I AM OUT OF SPACE, BUT LOTS TO LOOK FORWARD TO: A CHEAT PROGRAM FOR DUNGEON MASTER WHICH EDITS THE WHOLE THING, FIRE KING FROM ELEC ARTS, DEJA VU II AND MUCH MORE. SEE YOU THEN.

Red Heat

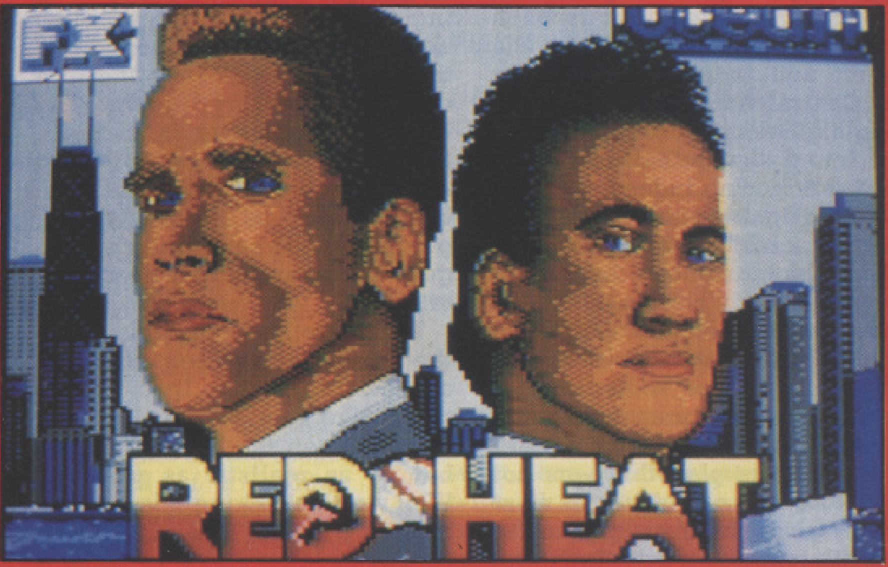
Ocean

Ocean have done very well out of film tie-ins. The best of these, Platoon and Robocop, were both obvious candidates for the basis of computer games, but it was thanks to the quality design and programming that they succeeded (and in Robocop's case, still succeeding) as games. Special FX, the creators of Hysteria, Firefly and Batman, were contracted for the celluloid-to-pixel conversion of the movie starring Arnold Schwartzenegger, Red Heat. A winning combination, surely? Well ...

A Russian drugs-dealer has overstepped the mark, and both East and West are out to bring him to justice. The game starts with you in a sauna full of offensive sweaty men. Of course, they all want a crack at chinning an ex-Mr Universe, so your exit from the sauna is severely hampered. A substantial area of the screen is blanked out, leaving just a strip in the middle for the action (if you could call it that). In fact, less than half of this has any sprite movement over it.

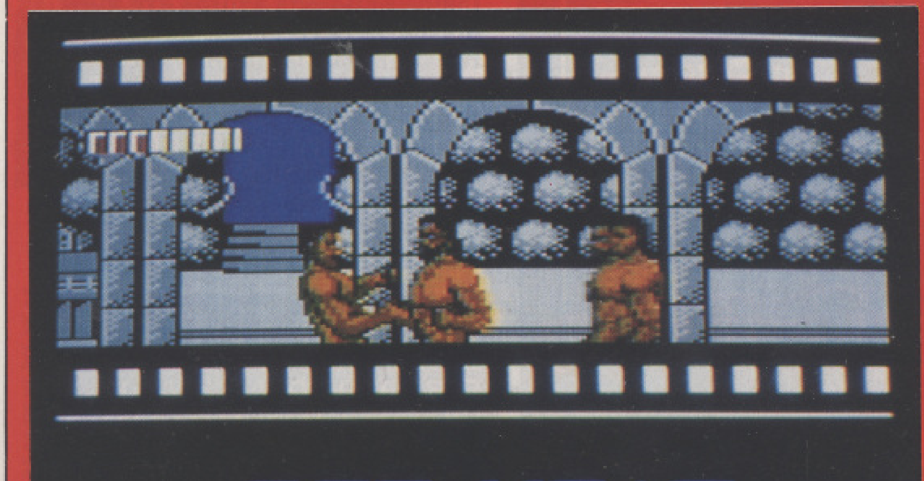
As you walk into the attack from left to right, the screen scrolls at an agonisingly slow rate. Before you can make any notable headway, a gang of muscular thugs approach and start beating you up. To start with you just have two modes of attack: a punch and headbutt. The punch can see off the enemies before they get close enough to get a pop at you, and the headbutt is used for close-in combat. Some opposents play dirty, throwing what look like shuriken at you. The idea is to duck these, but the slow control response rules out this defence.

Stick with it and you eventually emerge into a snowy landscape. There on the ground in front of you is a curious looking blob. Pick it up and the screen clears to be replaced by a large hand holding the blob, which is now glowing. A bit of trial and error reveals that sustained left/right stick waggling pushes a bar up the side of the screen. A few seconds later, the game continues as before, with a full energy supply for the player. The revelance of this is a complete mystery to me, and no reference to it is made in the instructions. It probably makes sense if you have seen the film, but I would not have thought a mention in the instructions was too much too ask.



After Robocop, Red Heat is a real downer. It is sad, but a fact, that I cannot remember a more unplayable game coming from Ocean in years. For one thing, the unbearably slow scrolling will have you grinding your teeth to dust. You will then gnash your toothless gums to a pulp as you are sent back to the start after coming within inches of completing the level. When the men in white coats come to take you away, don't say I didn't warn you.

T.H.

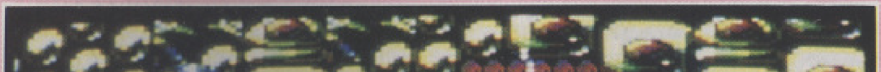


Graphics: 52%
Sound: 40%
Playability: 20%
Overall: 25%
Price: £9.95(cass)

PHOBIA

Image Works

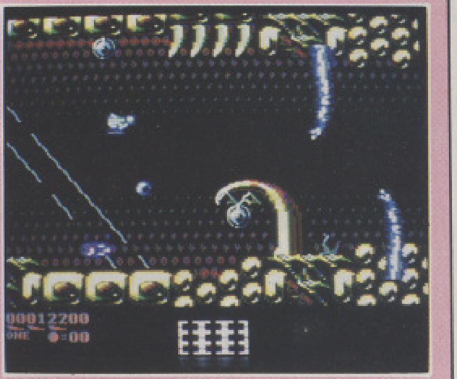
Two or three years ago, who would have thought the horizontally scrolling shoot 'em up would be alive and zapping in mid '89? Surprising as it is, R-Type clones, Nemesis variants, Scramble updates, call them what you will, are still proving popular with today's joystick jockeys. The difference is that now such games seem to need either a big name behind them, or else must excel in all departments in order to succeed. Phobia has the advantage of a highly resepcted name topping its credits; that of Tony Crowther, author of Bombuzal, Fernandez Must Die, Zig Zag and a string of hits from yesteryear.



For a change, the game's plot plays a significant part in the game itself. Phobos, infamous intergalactic trouble-maker, kidnapped the president's daughter, and is now holding her to ransom. Between his lair on the sun and the rest of the galaxy, Phobos has created a barrier of worlds, each inhabited by the most common objects of human phobias. As the SAS of the future, it is down to you to power your way through these worlds and rescue the poor damsel, who will no-doubt beg for your hand in marriage upon your arrival.

As far as stick handling goes, this entails much traditional alien wasting. Rather than blasting away at any aliens that happened to enter the programmer's head, you are pitted against a specific group in each level. Spiders come first. Some act along the lines of R-Type's walkers, others fill the screen with a lattice of deadly webs, and some winged varieties attack like a swarm of killer bees. What do you find waiting at the end of the level? A big daddy-long legs! My, who would have expected that?

Fear of birds, death and such like provide themes for subsequent levels, though the only real differences are graphical. Thee are some clever effects to be seen, none more impressive than a very deep graduated parallax scroll behind the main background. It is, however, a little shoddy in places,



typified as the claws of level one, break away from the background, and float unconvincingly towards you in two frams of animation. The sprites look like sprites, not scarey mutants from Mars, as they slide smoothly but unrealistically around the screen.

Phobia just doesn't cut in the end. The feeble arsenal is not enough to provide the essential satisfaction factor, and the game consequently leaves you with the thought "So what's new?". Tony Crowther has had his moments, but this is not one of them.

T.H.

Graphics: 59%
Sound: 60%
Playability: 40%
Overall: 41%
Price: £8.99 (cass)
£12.95 (disk)

Amiga

Although the machine is capable of coin-op quality visuals, the graphics of the Amiga are almost identical to the 64 version. The gameplay is left untouched, but for the addition of a slight vertical push-scroll which only serves to disorientate the player. Sound is similarly unimpressive.

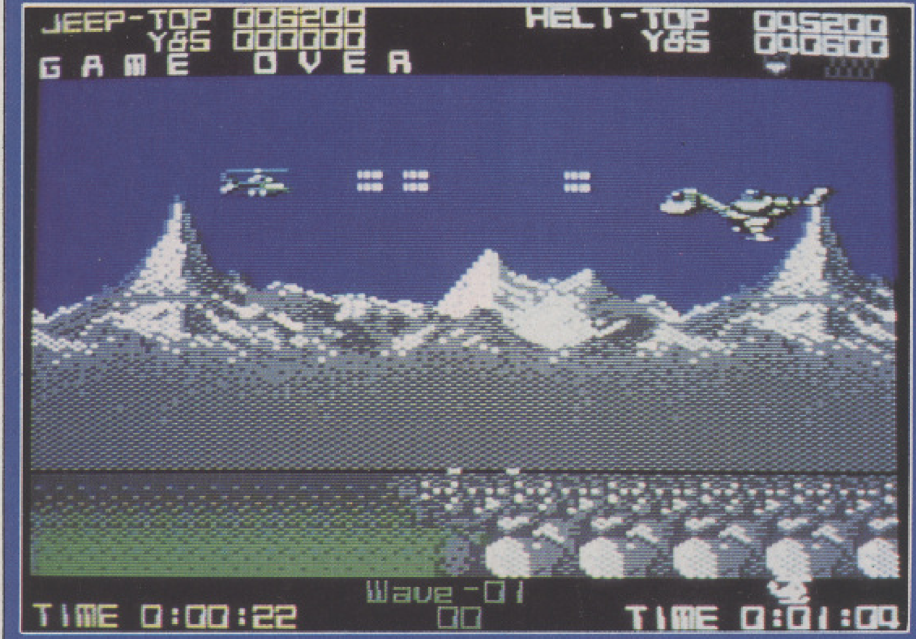
Graphics: 40%
Sound: 52%
Playability: 39%
Overall: 40%
Price: £19.99

Silkworm

Virgin

The power-crazy military generals of the world have begun an attempt to overthrow the political leaders. Earth only just managed to survive the last nuclear war, and the military gaining control would spell the end for the Earth. Who can stop the might of a whole planet's armed forces? Two daring (some would say suicidal) fellows volunteer for the job. A bunch of peace-loving scientists have come up with the hardware. One hero will pilot a nippy helicopter gunship, while the other takes the wheel of a customised jeep. Well, who ever heard of a plausible game scenario?

In the favoured fashion, you plough into the enemy from left to right. At the controls of the chopper you have both a forward and diagonally downward-firing cannon. Most of the attacking aircraft arrive one after the other but come from both directions. Since the chopper cannot fire backwards, the pilot is at a disadvantage in ambushes from the rear. This is where the jeep gets one over the chopper. Its gun can be rotated through 180 degrees, so the enemy has nowhere to hide. The price you pay for this is limited manoueverability. The jeep is confined to the ground and the few metres it can jump, so dodging the flak and gun emplacements is a tricky task.



Weapon upgrades are available throughout the levels. Shooting a landmine releases a twinkling cloud. Running into this will give you a short spell of invulnerability. You can then use any others on-screen as smart bombs by picking them up or shooting them. At certain times during each level, the screen clears and a gooseneck is assembled. Once the components have built-up, the gooseneck acts as a mini-mothership. Blow it away and it leaves behind a speed-up or double shot icon for collection. Similarly, the tanks and helicopters that guard the ends of the levels yeild power-ups when destroyed.

JEEP-TOP 005000
Y&S 000000
HELI-TOP
Y&S
Wave-01
TIME 0:00:00

Other than the inclusion of the jeep, there are very few new ideas to be found in Silkworm. However, the conversion has been carried out as well could be expected. The two-level parallax scrolling is unamazing, but glitch-free, as are all the enemy, player and missile sprites. As there are only a few sound effects it would have benefitted from some pacey in-game music. There are no astounding technical feats to admire, and the game design could not have taken long to knock up, but it plays well. The lifespan of such a game is probably not that great, but if you fancy a zap, Silkworm is the best the 64 has seen in the last couple of months.

T.H.

Graphics: 78%
Sound: 60%
Playability: 79%
Overall: 75%
Price: £9.99 (cass)
£14.99 (disk)

Amiga

Brilliant use of graphic and sound effects makes Silkworm even more playable on the Amiga than the 64. Fuller screens push the gameplay up to a frantic level, with guided missiles, anti-aircraft guns, goosenecks and waves of aircraft attacking simultaneously! Spectacular white-out effects as smart bombs are detonated, along with a generously powerful armoury leads to one of the most satisfying shoot 'em ups on the Amiga.

Graphics: 85%
Sound: 88%
Playability: 82%
Overall: 76%
Price: £24.99

WIN — WIN — WIN — WIN — WIN — WIN

The Man With The Hat is Back!

And this time he's in the pages of CCI. US Gold, who have licensed the title from Lucasfilms, are the proud sponsors of this month's competition. So grab for your explorer's cap and get ready, 6 of the 7 answers are in this issue!

First Prize — one lucky winner: An authentic Indiana Jones Lambskin jacket, the famous Indiana Jones Fedora, an Indiana Jones T-shirt, and two vouchers to see the film.

Second Prize — one winner: An Indiana Jones T-shirt, the book based on the film, the CD or cassette of the film soundtrack, and two vouchers to see the film.

Third Prize — one winner: The book, the CD or cassette of the film soundtrack, and two vouchers to see the film.

PLUS the next five winning entries drawn will receive a T-shirt and a voucher each to see the film, and we have an additional 5 T-shirts to give away to the next five!

Ready?

1. Which object do Indy and his dad search for in the film, 'Indiana Jones and the Last Crusade'?
2. How many levels are in the Lucasfilms game version of the film?
3. Name the US Gold manager responsible for the Indiana Jones game project.
4. Name the date of the first US Gold sale.
5. What is the name of the distribution company that is part of the US Gold 'empire'.
6. Name at least three companies which US Gold represents in Europe.

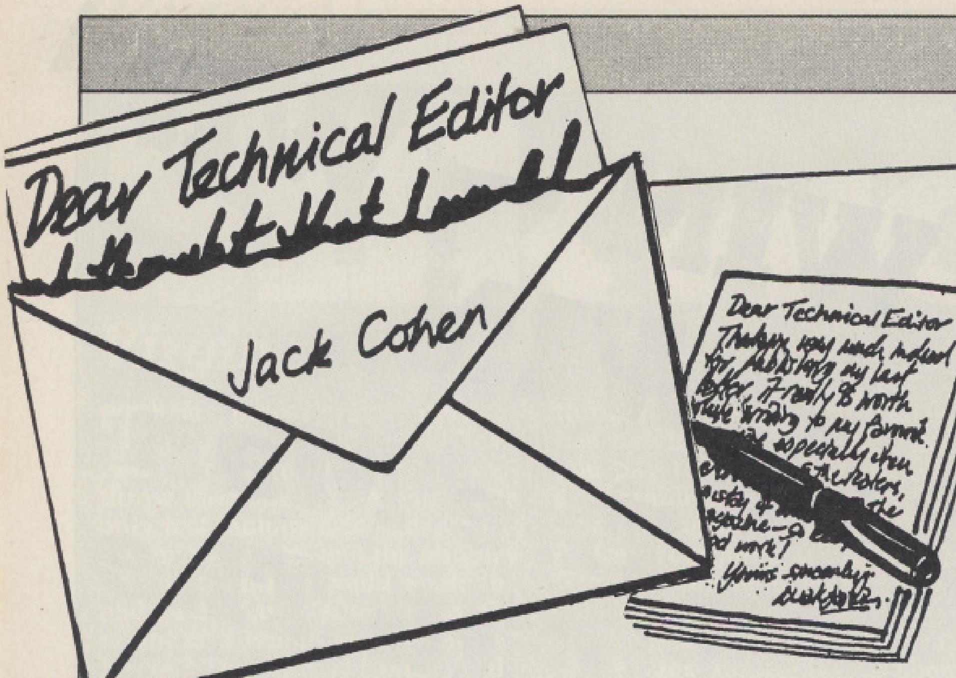
BONUS QUESTION ⋆ BONUS QUESTION ⋆ BONUS QUESTION

Get this one right, and if you are a winner, you will also win a year's free subscription to CCI — a copy of the game as well!!!

7. Where did Indiana Jones get his fedora, how old was he, and what was he doing at the time?

The winners will be drawn from the correct entries received (as long as there are no snakes in the bag ...). Answers on a postcard please by November 15 to: CCI/Indiana Competition, 40 Bowling Green Lane, London, EC1R 0NE.

(This competition is a Sue Baker/Nancy Picard/Tony Horgan Production)



Dear Sir

In a recent issue of your magazine Nick Williams of Bucks and Mr M Foreman of Cumbria both enquired about the availability of Vic 20 games and utilities. I would like to recommend Richard Grandy of Capri Marketing Ltd, 24A White Pit Lane, Flackwell Heath, High Wycombe, Bucks HP10 8HR.

I have ordered items from this company and the goods and service are very good.

I hope this is of some help to the Vic 20 owners out there.

Your faithfully,

Graham Vassie

Help for VIC 20 owners at last!

Dear Technical Editor

Please help before I pull out the rest of my hair.

I am now the proud owner of a SEIKOSHA GP-700VC Colour Printer, a freebie from a mate.

That's when my problems started, firstly, I own a well used C64 and I was told the printer was compatible with the 64, which on some word processors, it is.

I did not receive an instruction booklet with the printer so I don't know anything about it.

All I do know is when I hold dowqn the line feed button, I get a character set, of which a sample is attached.

I also have a number of an American Commodore Magazine called "RUN" (not a patch on yours) and I did find some control codes in an early edition, the problem is the codes listed for the Seikosha do not work, but the codes for the Commodore MPS1000 do not work, very confusing.

Please Help...

SGT Ray Lee, London

Dear SGT Lee

The self test routine for most printers is to switch on whilst holding down either the Line-feed or Form-feed controls.

This displays the character sets and shows that the printer is working. Phone Computer Manuals Ltd who may be able to help you to obtain a manual for your printer. They are on 021-706-6000.

Dear Technical Editor,

As an avid reader of CCI I wonder if you would be able to advise two problems.

I have recently bought a Warp 25 cartridge, and Oceanic disc drive and the GEOS Geowrite software for my Commodore 64. I have two difficulties.

I cannot get the Warp 25 to work with the Oceanic drive. Although it appears to save to disk and the programme appears in the disk directory, when I try to load the programme I persistently get a "File not found error". Is this due to an incompatibility between the Warp 25 and the Oceanic drive? I have written twice to Datel about it but they have not replied.

My second question is about printer compatibility with the Geowrite programme. I have an old VIC-1525 printer, which I believe to be Epson compatible and I wonder if Geowrite is capable of driving it. Presumably I will require to parallel interface. Can you recommend one? I have written twice to FSSL and once again got no reply, so you are my last resort.

I would be eternally grateful for your help.

DR KJ Wright

Dear Dr Wright,

It is sometimes difficult to use one non-standard device, let alone two, as in your case. Let us suppose that you want to load a program called "tested". First try LOAD"te",8 in case the name entered in the directory has spurious characters attached which cannot normally be seen.*

If you have a program which is a disk monitor then compare directory entries created by WARP 25 with normal entries.

In the directory block(s) observe the file name, this is in hex but most disk monitors translate ASCII for you.

The filename should be followed (unless exactly 16 characters) by a shifted space (ie A0) or enough to pad the entry to 16 characters.

If this is all you observe then LOAD"te",8 will not help.*

Another possible cause can be timing differences between the WARP 25 and the Oceanic drive.

This could result in a TIMEOUT on trying to load and an ensuing error message. I have not used the combination, so cannot help further, except to ask readers with a similar problem and a solution to write to CCI.

Serial to parallel interfaces are available from Meedmore Ltd of 28 Farriers Way, Netheryon, Merseyside L30 4XL, phone 051-521-2202 and quote catalogue no: A0036. It is in their June catalogue and Access and Visa are accepted.

Dear Technical Editor,

I would be most grateful if you would examine the enclosed listing to see if you can spot any obvious reason why it should not perform properly. I am not suggesting that you type this into a C64, merely that, with a greater expertise than mine, you can pinpoint any mistakes. NOT I HASTEN TO ADD IN MY LISTING; it is, I assure you, identical with the one published. It comes from a book, paperback, "29 programs for the Commodore 64/264" by S.D. Roberts, published 1984 in the Federal Republic of Germany by Ing. W. Hofacker GmbH. All the other programs in the book work perfectly and I have been trying over the last two years to get this one to run properly. It is supposed to allow the user to draw three dimensional functions on the screen or on a 1525 printer. It starts in the correct manner and asks for inputs first the mathematical function to be drawn in the form

z=function (x,y)

e.g. Z=X+(YxY) or Z=SIN (X)/Y)

then ranges for X, Y, Z and finally, the number of steps. I have followed the instructions exactly and all the input is accepted but an error message always comes up UNDEFINED STATEMENT Line 16. As well as the complete listing I also enclose a print-out of lines 2000 onwards AFTER THE PROGRAM HAS BEEN RUN. You will see that line 2002 is the last one to be uncorrupted and that many have disappeared. It seems to me that the input is not finding its way into the correct lines. The book instructions state:

"You have to type in the program exactly as it is listed, including the program lines of FFFFF's. If there are characters missing, the program may not work properly because the program would place the function in the wrong area."

Now you will note that hte number of FFF's in lines 106, 2030 and 7030 is 74, 73, 73 respectively. I have tried 74 in all three lines, and 73 in all three lines and various combinations but to no avail.

My pet theories for the failure to wotk

(1) Line 5 does not set top and bottom of BASIC to the correct new requirements.

(2) The program will only run on particular models of the C64 marketed in Germany (Ref. Book Title 'C64/264'). The one I use was purchased in this country Jan/Feb 1985.

(3) An error in the original published program. (I contacted the publishers in Germany who assured me that there was NOT and merely offered to sell me a disk at some exorbitant price.)

(4) An error in my listing which I cannot spot in spite of re-programming many times over the last two years and satisfying myself that my listing is identical with the original.

Incidentally, I could not take up the offer of buying the publisher's disk as then I did not have a disk-drive.

The book contains another program which draws a single Hi-Res plot of maths functions like Y=SIN (X) which works fine but it does not have any fancy inputting into lines full of FFFF's.

Finally, I have tried a number of functions including all those suggested in the book. None work, no matter what ranges and steps are put in and the so-called 3-D PLOT (enclosed listing).

I would be grateful for any suggestions (e.g. altering BASIC top and/or bottom) that I might try myself. Although I consider myself to be a reasonably competent programmer of the C64 I am never quite sure how to decide which areas to put new BASIC limits into.

Yours sincerely,
A.H. Bowden

Dear A.H. Bowden

There may be a simple solution to your problem, and that is a line overflow. I notice that of the lines containinf all 'F's, lines 2030 and 7030 take up one extra visible space.

Enter the 'F's by starting immediately after the line number (no space). Press RETURN but do not re edit these lines.

LIST and if 'F' appears on the following line then that could be the cause. Is it possible that there should be 75 'F's on each line and the printer has made the above mistake of re editing so that one 'F' disappears. The rpogram parses the lines that you enter in response to the input prompt from 1000 onwards, then pkes the function character by character into the machine side in the locations corresponding to the 'F's.

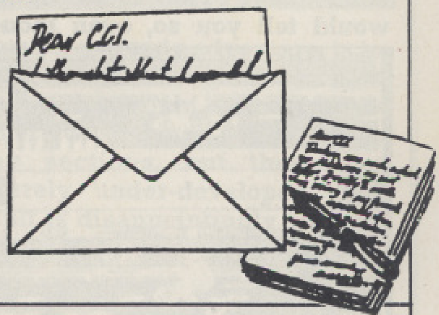
Make sure that every character in the program is entered including REM's and fullstops etc., even if you think that they are unnecessary.

If the program is out any characters then the function will be poked into ther wrong areas.

Check if this is happening by putting a STOP at the end of line 14 and then LISTing the program.

You should recognise the function in lines 106,2030 and 7030 or at least part of it.

If you had sent a copy on disk than I would have checked these points for you. Have a try and let us know how you get on.



Back To Basics

continued from page 56

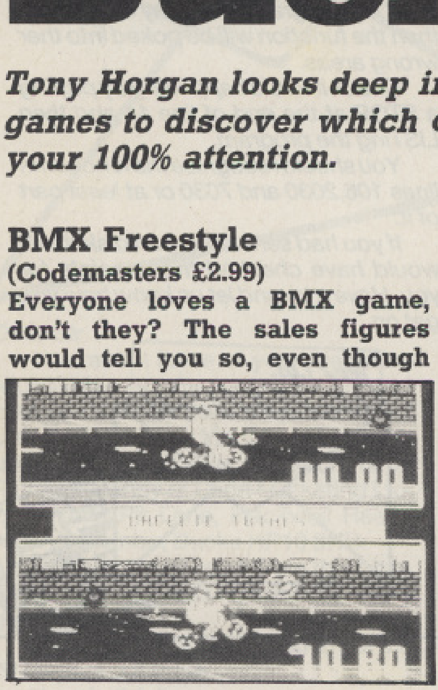
```
230 PRINT CL$:PRINT TAB(12);REV$;"************";ROF$:PRINT TAB(12);REV$;"*    C6
4  *";ROF$
240 PRINT TAB(12);REV$;"* D A T A *";ROF$
250 PRINT TAB(12);REV$;"* B A S E *";ROF$
260 PRINT TAB(12);REV$;"************";ROF$
270 PRINT:PRINT
280 REM PUT UP SCREEN DISPLAY
290 X=2:L$="":A$=CHR$(176):B$=CHR$(99):D$=CHR$(174)
300 FOR I=1 TO 32:L$=L$+B$:NEXT I
310 Z1$=A$+L$+D$:PRINT TAB(X);Z1$:E$=CHR$(98)
320 Z$=E$:FOR I=1 TO 32:Z$=Z$+" ":NEXT I:Z$=Z$+E$
330 FOR I=1 TO 12:PRINT TAB(X);Z$:NEXT I
340 I$=CHR$(173):K$=CHR$(189)
350 X$=I$+MID$(Z1$,2,32)+K$
360 PRINT TAB(X);X$:OK=FRE(0)
370 FOR I=1 TO 10:READ NAMES$(i):NEXT
380 FOR I=1 TO 10
390 A=LEN(NAMES$(I)):IF A<>22 THEN FOR J=A-1 TO 22:NAMES$(I)=NAMES$(I)+".":NEXT J
400 X=3:Y=9+1:GOSUB 430:PRINT NAMES$(I);" ";REV$;"(";STR$(I-1);" )";ROF$
410 NEXT I
420 RETURN
430 PRINT LEFT$(CD$,Y);LEFT$(CR$,X);:RETURN
440 DATA "DEFINE RECORDS","DISPLAY RECORDS","ADD RECORD","DELETE RECORD"
450 DATA "AMEND RECORD","SEARCH RECORDS","SORT RECORDS","SWAP RECORDS"
460 DATA "PRINT RECORDS","QUIT"
```

Bargain Bucket

Tony Horgan looks deep into the well of budget games to discover which ones deserve your 100% attention.

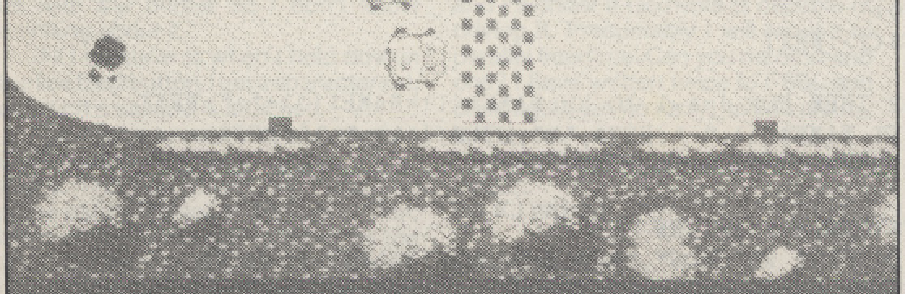
BMX Freestyle

(Codemasters £2.99)
Everyone loves a BMX game, don't they? The sales figures would tell you so, even though BMX went out with the ZXBO. You get six varieties of the sport: wheelies, ramp jump, half pipe, slow race, quarter pipe and freestyle tricks. The first section has you attempting a 45 metre wheelie. Tap the stick right to keep the wheel up, and watch out for the slippery puddles. The ramp jump is the Track and Field long jump, but this time on a bike. The rest are equally simple and uninteresting variations on the stick waggling theme.
Overall: 50%



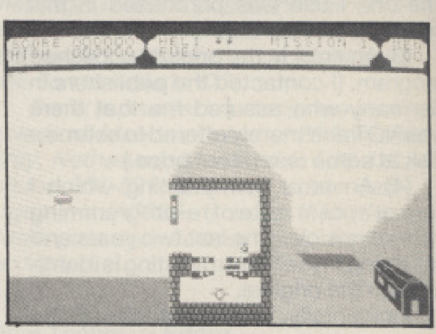
Rallycross Simulator

(Codemasters £299)
This gets my vote for the cheapo of the month. Rallycross is a clone of Sega's four-play coin-op Hot Rod, and not a bad one at that. The simultaneous multi-player feature has gone, but most of the rest has been included. Like the classic Super Sprint, the view is from directly above, but the tracks are a lot bigger, taking up a few scrolling screens. Oil slicks and puddles threaten to send the car into a spin, while opposing cars bump you off the track in the race for the best line around the hairpins. Pitstops must be made during the race to top up fuel levels and soup-up the car with turbos, improved traction and bumpers. Further dangers come from the express trains, rivers and main roads running straight through the tracks. Not much in the way of sound effects, but a good little coin-op clone at a fair price.
Overall: 83%



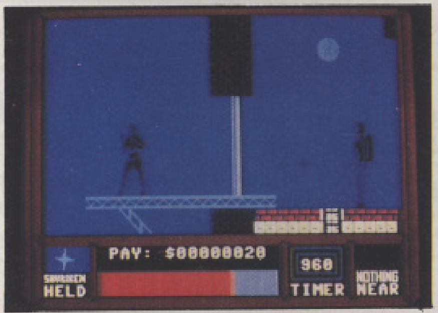
Blue Thunder

(Encore £1.99)
In the days when Elite were just known as Richard Wilcox Software, they released Blue Thunder. At the time, it was classed as a pretty handy shoot 'em up, but that was five years ago. It does show a little more creative design than some of today's R-Type clones, but the sound, graphics and general programming standards are understandably way below those expected in '89. It is interesting to take another look at the game that started Elite, but not interesting enough to be worth two quid.
Overall: 35%



Saboteur II

(Encore £1.99)
This flip-screen beat 'em up/arcade adventure was none too impressive in its day. The game has come across from its original Spectrum format without the slightest hint of any improvements. Limiting hires mode is used for the graphics, so everything is drawn as silhouettes against block-coloured backdrops. Character animation is unrealistic and jerky, and the fight sequences are rather pathetic. The sum of the sound appears to be just a sing-



le white noise tap. A sub-standard re-release all round.
Overall: 35%

Daley Thompson's Decathlon

(Hit Squad £2.99)
Ocean give you ten ways to break a joystick with their first Daley-endorsed game. The sprites are stumpy and look nothing like Daley Thompson, but if you want a cheap stick waggler, you can't go far wrong with this. Activision's re-released Decathlon looks better, but Daley's inclusion of an "angle" feature in most events beats it as far as gameplay goes. Dated but fun.
Overall: 78%

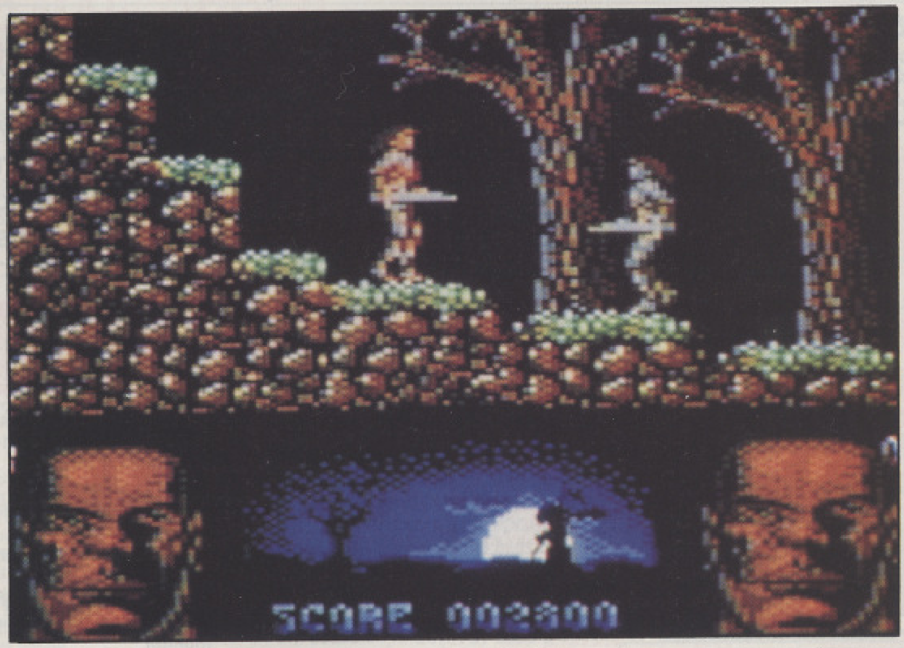
1942

(Encore £1.99)
1942 was not one of Elite's better coin-op conversions. The Capcom arcade machine was unspectacular and unoriginal, but did score with a fair number of arcade goers. A vertically scrolling shoot 'em up of the plainest kind, it would have made a worthwhile budget release a few years ago, but today is likely to send you to sleep. Very basic sprites and non-interactive backgrounds help make it one to miss.
Overall: 40%

SCORE 0000200
LIVES
ROLLS
HIGH-SCORE 0040000

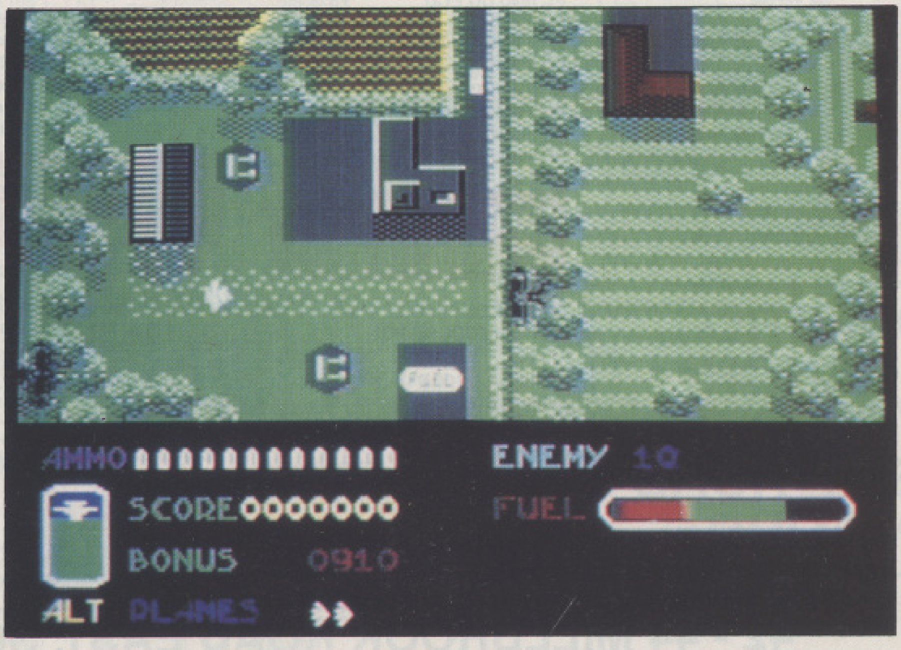
Storm Warrior

(Encore £1.99)
Contrary to the rest of the Encore range, Storm Warrior is not a re-release. It was coded by the team behind the 64 Forgotten Worlds conversion. It looks nice, with a well drawn and smoothly animated centre sprite, but the game design seems to have been cut off half way through production. What at first looks like a promising arcade adventure, is in fact a simplistic flip-screen beat 'em up. That would be fair enough if there was enough to the swordplay sections, but these are severely under-developed. The result is disappointingly tedious.
Overall: 38%



Arcade Flight Simulator

(Codemasters £2.99)
Played over horizontally scrolling screens with vertical wrap-round, Arcade Flight Sim is reminisent of the early dogfight arcade games. The idea is simple: shoot down all the enemy planes, then pick up a bom and drop it on their base. Thee is also a two player game, in which the object is simpler still: shoot your opponent down before he does the same to you. The game is neat, enjoyable, and fairly original as shoot 'em ups go.
Overall: 67%
T.H.



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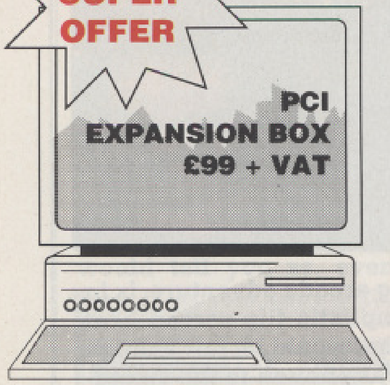
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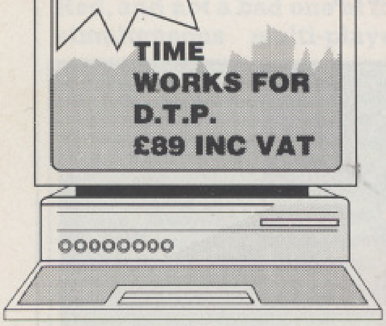
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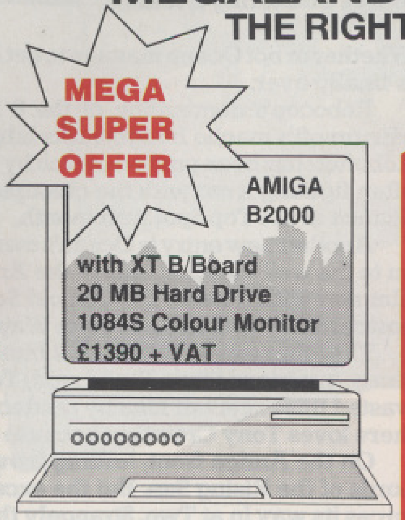

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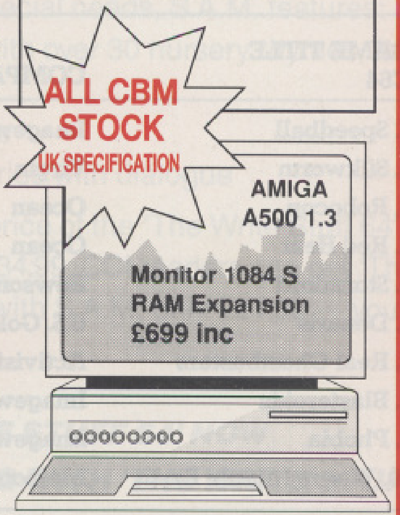

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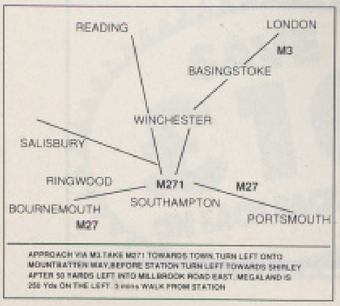

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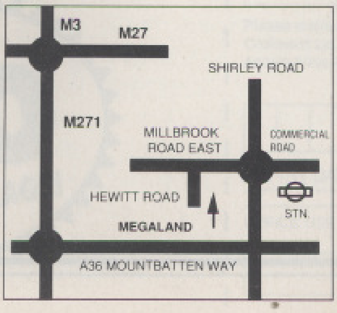

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Charts

Chart Chattering Events

Whether or not Ocean manage to get it included in the Guiness Book of Records, its reign at the top is finally over.

Robocop's domination of the 8 Bits has been arrested (!). We have a new Numero Uno, Mirrorsoft's macho Imageworks label has whizzed its Speedball up to be the King of the Castle. Robofuzz has been pushed out too by Virgin's hot new Silkworm. Virgin is not the name we see too often fighting it out with the champions but Silkworm looks like it might well be in there with a chance at the Top Spot next month.

Another new entry is Ocean's own hope to replace Robobobby, Red Heat, the game that hangs on to the well muscled tails of the Arnie Schwarzennegar movie. (Can you imagine becoming a film star with a name like Arnold Schwarzenneger? I'll send the first reader to write me, on a postcard, the real name of John Wayne, a copy or Arnie's game!)

The other entry this month is Imageworks (yes, again!) Phobia. (Now that's a great name for a game, my friend Siigie Freud said) Tony the Horg thinks that his namesake, Tony Crowther has wasted this excellent idea by producing just another unoriginal shoot 'em up. But somebody out there loves Tony Crowther because you're buying it enough for it to reach Nine.

On the Amiga front, lording it over from the rest is still last month's Boss from Cinemaware, Lords of the Rising Sun. But the excellent Kick Off from Anco (remember we tipped it to you!) forces its way in at Two. Strangely there's another football (UK-style) game, MicroProse Soccer also entering this month.

Budgetwise, Ocean's new cheapisimo label, The Hit Squad, not only holds onto the Heaviest Hitter Spot but grabs Five with another recent release, Daley Thompson' (whatever happened to him?)s Olympic Challenge. Codemasters have two in with new entry Rally Cross showing a fast move into Four and Arcade Flight Simulator too. See you next month, folks! If I can stop playing Kick Off, that is!

Zak (Mule) Skinner

GAME TITLE	COMPANY	LAST MONTH	PRICE	RATING
C64				
1. Speedball	Imageworks	(2)	£9.95	Mega
2. Silkworm	Virgin	(-)	£9.95	Mega
3. Robocop	Ocean	(1)	£9.95	Mega
4. Red Heat	Ocean	(-)	£9.95	Crisp
5. Stormlord	Hewson	(4)	£9.95	Crisp
6. Denaris	U.S. Gold	(3)	£9.95	Mega
7. Real Ghostbusters	Activision	(7)	£9.99	Crisp
8. Blasteroids	Imageworks	(8)	£9.99	Crisp
9. Phobia	Imageworks	(-)	£9.99	Dodgy
10. War in Middle Earth	Melbourne House	(9)	£14.95	Mega
Amiga				
1. Lords of the Rising Sun	Cinemaware	(1)	£29.99	
2. Kick Off	Anco	(-)	£19.99	
3. MicroProse Soccer	MicroProse	(-)	£24.95	
4. Populous	Electronic Arts	(2)	£24.95	
5. Blood Money	Psygnosis	(3)	£24.95	
Budgets				
1. Rambo	The Hit Squad	(1)		
2. Arcade Flight Sim.	Codemasters	(2)		
3. Bombjack II	Encore	(4)		
4. Rally Cross	Codemasters	(-)		
5. Daley Thompson's Olympic Challenge	The Hit Squad	(-)		

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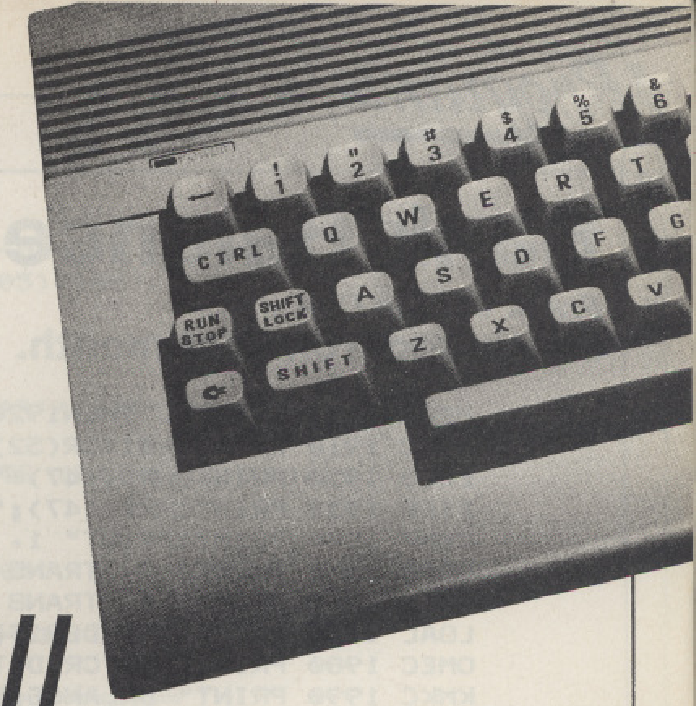

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Bank Balance

Frank Carson C64

continued from last month.

```
MPOA 1900 IFA$="C"THEN1920
HNBC 1910 DB(52)=B1:CR(52)=B2:BL(52)=B3
EECG 1920 PRINTCHR$(147)+"[SP5]RECORD NUMBER";NR
EIFP 1930 PRINTCHR$(147);"CONTENTS OF RECORD";NR
CEHP 1940 PRINT:PRINT" 1. DATE[SP9]=[SP3]"+B1$
GGFA 1950 PRINT" 2. TRANS TYPE[SP3]=[SP3]"+B2$
NMCM 1960 PRINT" 3. TRANS DETAILS=[SP3]"+B3$
LOAL 1970 PRINT" 4. DEBIT[SP8]= £";B1
OMEC 1980 PRINT" 5. CREDIT[SP7]= £";B2
KMKC 1990 PRINT" BALANCE[SP9]= £";B3
GDLE 2000 PRINT:PRINT" ENTER THE NUMBER REQUIRED."
EDJA 2010 PRINT:PRINT" ENTER 'A' FOR ANOTHER RECORD."
NGGK 2020 PRINT" ENTER 'M' TO RETURN TO MENU."
OJLJ 2030 PRINT" ENTER 'C' TO COPY AN EXISTING RECORD."
MJCM 2040 PRINT" ENTER 'E' TO ESCAPE."
LACC 2050 SYS49152
JPJG 2060 PRINT"[SP4]READY FOR NEXT INPUT."
JBFF 2070 PRINT"[SP4]******************** "
ACLE 2080 GETA$:IFA$=""THEN2080
EMDA 2090 IF A$="1" THEN GOSUB2500:GOTO2050
BCCN 2100 IF A$="2" THEN GOSUB2590:GOTO2050
BLAH 2110 IF A$="3" THEN GOSUB2680:GOTO2050
HLFC 2120 IF A$="4" THEN GOSUB2770:GOSUB2350:GOTO2050
OFDL 2130 IF A$="5" THEN GOSUB2860:GOSUB2350:GOTO2050
MDPF 2140 IF A$="A" THEN 2290
PILC 2150 IF A$="M" THEN 2290
GKCO 2160 IF A$="C" THEN 2190
NMLF 2170 IF A$="E" THEN 2260
EDGI 2180 GOTO 2080
JAJI 2190 SYS 49152
MOAE 2200 PRINT"ENTER NUMBER OF RECORD TO BE COPIED."
KAOP 2210 PRINT:INPUTZ
LHJJ 2220 AA$(NR)=AA$(Z):AB$(NR)=AB$(Z):AC$(NR)=AC$(Z)
OCAJ 2230 A1$=AA$(NR):A2$=AB$(NR):A3$=AC$(NR)
GDED 2240 DB(NR)=DB(Z):CR(NR)=CR(Z):BL(NR)=BL(Z)
PFJD 2250 GOSUB2430:GOTO1860
GDMF 2260 AA$(NR)=AA$(52):AB$(NR)=AB$(52):AC$(NR)=AC$(52)
IPNG 2270 DB(NR)=DB(52):CR(NR)=CR(52):BL(NR)=BL(52)
HDJJ 2280 GOSUB2430:GOTO750
OLBK 2290 IFDB(NR)=0ANDCR(NR)=0THEN2260
IIIN 2300 IF NR<DB(0)THEN 2320
LLGC 2310 DB(0)=DB(0)+1:NR=DB(0)
AOGE 2320 IF DB(0)>51 THEN DB(0)=51:NR=51
OBPO 2330 IF A$="A"THEN 1760
ABMI 2340 GOTO 750
OIHN 2350 GOSUB2430
HEJK 2360 RW=7:CL=20:GOSUB2390
AJGJ 2370 PRINTBL(NR)
IECK 2380 RETURN
HAOA 2390 POKE214,RW:POKE211,CL:SYS58732
LKPF 2400 PRINT"[SP15]"
HEBO 2410 POKE214,RW:POKE211,CL:SYS58732
KPNJ 2420 RETURN
```

```
PDIK 2430 FORI=NR TO DB(0)+1
CNAI 2440 BL(I)=BL(I-1)+CR(I)-DB(I)
HKPE 2450 BL(I)=INT((BL(I)+.005)*100)/100
DOJA 2460 NEXTI
PFJE 2470 RETURN
AFDB 2480 REM
JGGG 2490 REM ********* DATE ************
EPNC 2500 SYS 49152
EALI 2510 PRINT"[SP2]ENTER DATE (MAX 10 CHARS.)"
DIDC 2520 A4$=DT$:Z1=11
FBAP 2530 GOSUB2960
AJJI 2540 RW=2:CL=21:GOSUB2390
JCKM 2550 PRINTZ2$
CABK 2560 A1$="|"+Z1$:AA$(NR)=A1$
BMIB 2570 RETURN
ACGJ 2580 REM========= TYPE ==========
PEMD 2590 SYS 49152
ONJI 2600 PRINT"[SP2]ENTER TRANSACTION TYPE (MAX 10 CHARS)"
GBOO 2610 A4$=DT$:Z1=11
LDCK 2620 GOSUB2960
MGGD 2630 RW=3:CL=21:GOSUB2390
OMEO 2640 PRINTZ2$
JAAA 2650 A2$=Z1$:AB$(NR)=A2$
MKFG 2660 RETURN
JJOL 2670 REM========= DETAILS ========
IKCB 2680 SYS 49152
JNPM 2690 PRINT"ENTER TRANSACTION DETAILS.(MAX 16 CHARS)"
PPCA 2700 A4$="|"+NM$:Z1=17
MOPP 2710 GOSUB2960
PMEO 2720 RW=4:CL=21:GOSUB2390
FMFH 2730 PRINTZ2$
OHBB 2740 A3$=Z1$:AC$(NR)=A3$
BFHI 2750 RETURN
IJNH 2760 REM====== DEBIT ============
JEPA 2770 SYS 49152
PODA 2780 B1=0
GIBD 2790 PRINT" ENTER AMOUNT OF DEBIT.(MAX £99999.99 )"
AKPF 2800 PRINT:INPUTB1
NJFK 2810 B1=ABS(B1):DB(NR)=B1
BDDD 2820 RW=5:CL=20:GOSUB2390
DPKF 2830 PRINTB1
CPFG 2840 RETURN
KGGB 2850 REM====== CREDIT ===========
EGPO 2860 SYS 49152
HOKC 2870 B2=0
JIMM 2880 PRINT" ENTER AMOUNT OF CREDIT.(MAX £99999.99 )"
LNMM 2890 PRINT:INPUTB2
LPCC 2900 B2=ABS(B2):CR(NR)=B2
GJNI 2910 RW=6:CL=20:GOSUB2390
MDGK 2920 PRINTB2
EHNM 2930 RETURN
NGHH 2940 REM
GPKC 2950 REM ********INPUT Z1$ ***********
BEDL 2960 POKE214,20:POKE211,1:SYS58732
CJLM 2970 PRINTA4$
KLJA 2980 POKE214,18:POKE211,0:SYS58732
FJNI 2990 Z1$="":PRINT:INPUTZ1$
GBMK 3000 IF Z1$=""THEN2980
FDAH 3010 IF LEN(Z1$)<Z1-1THENZ1$=Z1$+" ":GOTO3010
```

cont. on next page

```
FGOI 3020 Z2$=LEFT$(Z1$,Z1-1)
EPOC 3030 Z1$=Z1$+"|"
OCFN 3040 Z1$=RIGHT$(Z1$,Z1)
JPMI 3050 RETURN
MHMA 3060 REM
NFOM 3070 REM******* SAVE FILE *************
OAHK 3080 PRINTCHR$(147)
MKJH 3090 IF DV=8THEN3120
OIMI 3100 OPEN8,1,2
HBHP 3110 GOTO3350
JJDC 3120 PRINT:PRINT"THE PRESENT DATA FILE:-[SP2]"+F$
DBIA 3130 PRINT:PRINT"PRESS RETURN ONLY TO SAVE "+F$
NBHD 3140 PRINT:PRINT"OR ENTER A NEW NAME IF REQUIRED."
PGMI 3150 FORI=ITO1000:NEXTI
PGOH 3160 PRINT:PRINT:INPUTF$
HAEG 3170 OPEN15,8,15
OGNI 3180 PRINT:PRINT"[SP3]SAVING "+F$
BFIA 3190 OPEN 8,8,8,"0:"+F$+",S,W"
CPOO 3200 INPUT#15,R,X$,Y,Z
KPLO 3210 IF R=0 THEN 3350
KLBN 3220 CLOSE8 :CLOSE15:PRINTCHR$(147)
OJMI 3230 PRINT:PRINT:PRINT"[SP6]"+CHR$(18)+X$+CHR$(146)
HGCO 3240 IF R<>63THEN760
BOFL 3250 PRINT:PRINT"DO YOU WISH TO OVER-WRITE"
HPKN 3260 PRINT:PRINT" PRESS Y OR N[SP2]"
FLBC 3270 GETX$:IFX$=""THEN3270
KIGD 3280 IFX$="Y"THEN 3300
MIOL 3290 GOTO 750
HHFL 3300 PRINT:PRINT"[SP3]SCRATCHING OLD[SP2]"+F$
LDDG 3310 OPEN15,8,15
IION 3320 PRINT#15,"S:"+F$
LAMP 3330 CLOSE15
IGMA 3340 GOTO 3170
DNJA 3350 PRINT#8,LB$
GKOE 3360 FOR I=0TO52
PAGA 3370 PRINT#8,AA$(I)
AHPB 3380 PRINT#8,AB$(I)
ELLB 3390 PRINT#8,AC$(I)
OBHH 3400 PRINT#8,DB(I)
IJBE 3410 PRINT#8,CR(I)
BCLH 3420 PRINT#8,BL(I)
JGNP 3430 NEXT I
ICDP 3440 CLOSE8:CLOSE15:GOTO750
IDPO 3450 REM**********LINE OF PRINT ********
LILF 3460 FORX=BE TO EN
DLGO 3470 LN$=AA$(X)+AB$(X)+AC$(X):G1=0
FJBB 3480 G=DB(X):GOSUB3670:B1$="|D£"+RIGHT$(PR$,5)+DE$
FJCH 3490 G=CR(X):GOSUB3670:B2$="C£"+RIGHT$(PR$,5)+DE$
JMGG 3500 G1=BL(X):G=ABS(G1):GOSUB3670
DGJD 3510 RN$=STR$(X):RN$=RIGHT$(RN$,2)
ILGM 3520 RN$="R#"+RN$+"|"
AJML 3530 B3$="B£"+RIGHT$(PR$,6)+DE$+RN$
PGAI 3540 IF J=1THEN 3560
KJAJ 3550 PRINTLN$;
MPNJ 3560 IF DB(X)=0THENB1$=DT$
EDOF 3570 IF CR(X)=0THENB2$=TR$
LBJO 3580 IF J=1THEN 3620
MKJC 3590 PRINTB1$+B2$+B3$;
IBJC 3600 PRINTPL$;
```

```
HHNN 3610 GOTO3640
KLCE 3620 P1$=B1$+B2$+B3$:P1$=RIGHT$(P1$,39)
EAOK 3630 PRINT#4,LN$+P1$
NJJN 3640 NEXTX
OJLE 3650 RETURN
AFEO 3660 REM************ STRING CONV *******
KBAG 3670 PR=INT(G):DE=G-PR
LBGA 3680 DE=INT(DE*100+.006)/100
AECC 3690 PR$=STR$(PR):DE$=STR$(DE)
AEMO 3700 MI=LEN(PR$):PR$=RIGHT$(PR$,MI-1)
GJFO 3710 IF G1<0 THEN PR$="-"+PR$
OHAO 3720 IF DE=0 THEN DE$=".00|":GOTO3750
KPNF 3730 IF LEN(DE$)<4 THEN DE$=DE$+"0":GOTO3730
JFCA 3740 DE$=RIGHT$(DE$,3):DE$=DE$+"|"
DLGP 3750 IF LEN(PR$)<6THENPR$=" "+PR$:GOTO3750
DGJK 3760 RETURN
S-ENTRY CODE = EHLM
```

Hi-RES Hardcopy

Jean-Luc Lebrun C64, C128

Print with any kind of C64 compatible printer the hi-res bitmap that you previously chose with the help of a menu. Type SYS49152 when you have loaded it, and follow the instuctions.

```
GKKH 10 FOR I= 49152 TO 50848
NLJN 20 READ D:POKE I,D
AIHB 30 CS=CS+D
FOJB 40 NEXT I
IKLG 50 IFCS<>204210THENPRINT"DATA ERROR!!!!!":END
KDBA 60 SYS49152
MJBD 1000 DATA 032,156,193,032,233,193,032,078,196,032,216,194,169,128
LANE 1007 DATA 141,013,196,169,001,141,014,196,173,124,192,141,015,196
DMPD 1014 DATA 162,000,236,008,196,240,039,189,070,033,045,013,196,141
MMKK 1021 DATA 032,196,173,014,196,073,255,141,059,192,032,083,193,173
PFBC 1028 DATA 015,196,041,253,013,032,196,141,015,196,024,046,014,196
NHDE 1035 DATA 232,076,030,192,162,000,236,009,196,240,039,189,128,034
GFKF 1042 DATA 045,013,196,141,032,196,173,014,196,073,255,141,105,192
OIIH 1049 DATA 032,083,193,173,015,196,041,191,013,032,196,141,015,196
GFIC 1056 DATA 024,046,014,196,232,076,076,192,173,015,196,073,000,009
GPCI 1063 DATA 128,141,015,196,238,032,208,173,015,196,032,210,255,032
OPGA 1070 DATA 150,193,024,110,013,196,173,013,196,201,000,208,003,076
HFMG 1077 DATA 159,192,076,017,192,173,023,196,201,039,240,037,238,023
MOMF 1084 DATA 196,162,008,238,082,192,208,003,238,083,192,238,036,192
JLMD 1091 DATA 208,003,238,037,192,202,208,237,169,128,141,013,196,169
IEBI 1098 DATA 001,141,014,196,076,022,192,173,006,196,201,028,240,017
FKIL 1105 DATA 238,006,196,032,015,195,169,013,032,210,255,032,150,193
BFOE 1112 DATA 076,012,192,169,013,032,210,255,169,015,032,210,255,169
JAMF 1119 DATA 004,032,195,255,032,204,255,234,234,234,234,173,016,196
LIDA 1126 DATA 141,032,208,173,017,196,141,033,208,173,018,196,141,134
PHHI 1133 DATA 002,173,019,196,133,211,173,020,196,133,214,162,000,189
KDBD 1140 DATA 000,199,157,000,004,189,000,200,157,000,005,189,000,201
NIAP 1147 DATA 157,000,006,189,000,202,157,000,007,189,000,203,157,000
JEFA 1154 DATA 216,189,000,204,157,000,217,189,000,205,157,000,218,189
CHDG 1161 DATA 000,206,157,000,219,232,208,205,096,234,234,234,234,234
```

continued on page 90

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ELAC 1168 DATA 234,234,234,173,013,196,205,014,196,240,004,016,003,048
NMHB 1175 DATA 028,096,173,013,196,141,033,196,173,014,196,141,034,196
HFID 1182 DATA 078,032,196,078,033,196,173,033,196,205,034,196,208,242
DBPC 1189 DATA 096,173,013,196,141,033,196,173,014,196,141,034,196,014
BAPC 1196 DATA 032,196,014,033,196,173,033,196,205,034,196,208,242,096
HGEL 1203 DATA 169,059,032,210,255,096,173,032,208,141,016,196,173,033
BAAO 1210 DATA 208,141,017,196,173,134,002,141,018,196,165,211,141,019
MHMJ 1217 DATA 196,165,214,141,020,196,162,000,189,000,004,157,000,199
KJFJ 1224 DATA 189,000,005,157,000,200,189,000,006,157,000,201,189,000
IJGJ 1231 DATA 007,157,000,202,189,000,216,157,000,203,189,000,217,157
LPJG 1238 DATA 000,204,189,000,218,157,000,205,076,232,195,096,096,173
OLCL 1245 DATA 017,208,041,239,141,017,208,169,000,141,033,208,141,032
CCDC 1252 DATA 208,169,013,141,134,002,162,000,189,128,196,032,210,255
MKCC 1259 DATA 232,224,176,208,245,173,017,208,009,016,141,017,208,088
ALAL 1266 DATA 165,203,162,000,172,141,002,192,001,208,002,162,008,201
JOIM 1273 DATA 004,240,018,232,201,005,240,013,232,201,006,240,008,232
OECJ 1280 DATA 201,003,240,003,076,020,194,169,194,141,068,194,189,160
DGHK 1287 DATA 197,141,067,194,076,069,194,169,032,141,001,196,169,000
FLJD 1294 DATA 141,000,196,076,118,194,169,064,141,001,196,169,000,141
GLAE 1301 DATA 000,196,076,118,194,169,096,141,001,196,169,000,141,000
JCOE 1308 DATA 196,076,118,194,169,128,141,001,196,169,000,141,000,196
PECJ 1315 DATA 162,080,160,255,136,208,253,202,208,248,162,000,189,048
BBFJ 1322 DATA 197,032,210,255,232,224,112,208,245,162,000,165,203,234
IADC 1329 DATA 201,004,240,013,232,201,005,240,008,232,201,006,240,003
IJFF 1336 DATA 076,141,194,169,194,141,176,194,189,176,197,141,175,194
APOI 1343 DATA 076,177,194,169,000,141,124,192,076,196,194,169,255,141
NEAL 1350 DATA 124,192,076,196,194,076,227,195,162,000,189,184,197,032
JNLB 1357 DATA 210,255,232,224,056,208,245,165,203,201,060,208,250,096
LDAP 1364 DATA 169,152,141,007,196,173,000,196,141,002,196,173,001,196
GGPM 1371 DATA 141,003,196,169,000,141,006,196,162,002,173,002,196,056
HNGC 1378 DATA 233,160,176,003,206,003,196,141,002,196,202,208,239,162
EKLP 1385 DATA 004,169,010,032,210,255,202,208,248,032,015,195,096,173
NHBB 1392 DATA 007,196,201,112,208,005,169,007,076,136,195,024,248,173
NFII 1399 DATA 007,196,105,009,141,007,196,216,234,234,173,007,196,074
NIBI 1406 DATA 074,074,074,141,008,196,173,007,196,041,015,141,009,196
COMA 1413 DATA 173,006,196,201,028,208,015,169,064,141,007,196,169,004
GKFH 1420 DATA 141,008,196,169,000,141,009,196,056,173,002,196,141,032
CHLF 1427 DATA 196,173,003,196,141,033,196,169,008,237,008,196,141,010
PPCC 1434 DATA 196,170,238,032,196,208,003,238,033,196,202,208,245,162
IBHC 1441 DATA 002,173,002,196,024,105,160,144,003,238,003,196,141,002
BKFJ 1448 DATA 196,202,208,239,076,048,196,096,141,007,196,169,000,141
MHMO 1455 DATA 008,196,169,007,141,009,196,162,002,173,036,192,056,233
BKNC 1462 DATA 156,176,003,206,037,192,141,036,192,173,082,192,056,233
AGIL 1469 DATA 156,176,003,206,083,192,141,082,192,202,208,225,169,000
MACH 1476 DATA 141,023,196,096,238,033,196,208,003,238,034,196,202,208
HCAG 1483 DATA 245,173,033,196,141,036,192,173,034,196,141,037,192,173
NNJB 1490 DATA 082,192,141,002,196,173,083,192,141,003,196,206,006,196
AAMN 1497 DATA 096,104,104,076,249,192,189,000,219,157,000,206,232,240
OBFF 1504 DATA 003,076,186,193,096,234,234,234,234,234,234,234,234,234
GINC 1511 DATA 234,234,000,032,128,034,144,135,002,037,002,005,006,000
CIGM 1518 DATA 000,128,128,128,254,246,014,000,006,000,000,000,000,000
HFNC 1525 DATA 000,000,000,000,000,000,000,064,064,000,000,076,000,000
CPEA 1532 DATA 000,000,000,000,000,000,000,000,173,002,196,141,082,192
KBGI 1539 DATA 173,003,196,141,083,192,173,032,196,141,036,192,173,033
LOGC 1546 DATA 196,141,037,192,169,000,141,023,196,096,234,234,234,234
OMOF 1553 DATA 234,234,234,234,234,234,234,234,234,169,001,141,025,196
ONCJ 1560 DATA 162,255,160,255,136,208,253,202,208,248,206,025,196,208
JFPA 1567 DATA 241,169,147,032,210,255,032,128,198,096,234,234,234,234
MHLP 1574 DATA 234,234,234,234,147,142,079,080,084,073,079,078,032,049
```

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LNCA 1581 DATA 058,067,072,079,073,067,069,032,079,070,032,066,073,084
JEJJ 1588 DATA 077,065,080,039,083,032,070,073,082,083,084,032,077,069
LLJF 1595 DATA 077,079,082,089,032,029,029,029,029,029,029,029,032,076
HBLP 1602 DATA 079,067,065,084,073,079,078,013,017,017,029,029,029,029
NMAA 1609 DATA 070,049,058,066,046,070,046,077,046,076,046,061,036,050
OHOK 1616 DATA 048,048,048,013,017,029,029,029,029,070,051,058,066,046
DDAA 1623 DATA 070,046,077,046,076,046,061,036,052,048,048,048,013,017
NBGL 1630 DATA 029,029,029,029,070,053,058,066,046,070,046,077,046,076
IDLB 1637 DATA 046,061,036,054,048,048,048,013,017,029,029,029,029,070
NBAG 1644 DATA 055,058,066,046,070,046,077,046,076,046,061,036,056,048
JHCK 1651 DATA 048,048,013,017,029,029,029,029,070,056,058,067,065,078
OGAH 1658 DATA 067,069,076,032,072,065,082,068,067,079,080,089,147,142
LLIK 1665 DATA 079,080,084,073,079,078,032,050,058,067,072,079,073,067
IPBH 1672 DATA 069,032,079,070,032,080,073,088,069,076,039,083,032,080
FAKB 1679 DATA 082,073,078,084,073,078,071,032,077,079,068,069,013,017
NNEM 1686 DATA 017,029,029,029,029,070,049,058,080,046,080,046,077,046
LIOP 1693 DATA 061,082,086,083,032,079,070,070,013,017,029,029,029,029
ALIA 1700 DATA 070,051,058,080,046,080,046,077,046,061,082,086,083,032
KPLK 1707 DATA 079,078,013,017,029,029,029,029,070,053,058,067,065,078
JCOK 1714 DATA 067,069,076,032,072,065,082,068,067,079,080,089,069,082
NFFI 1721 DATA 095,108,000,000,000,000,193,193,193,193,255,255,255,255
NGKE 1728 DATA 177,185,193,000,000,000,000,000,147,142,077,065,075,069
MNHO 1735 DATA 032,083,085,082,069,032,089,079,085,082,032,080,082,073
IHOC 1742 DATA 078,084,069,082,032,073,083,032,082,069,065,068,089,044
GFKE 1749 DATA 084,072,069,078,013,080,082,069,083,083,032,083,080,065
EGMC 1756 DATA 067,069,032,066,065,082,032,032,255,255,255,255,255,255
LIJD 1763 DATA 255,255,255,255,255,255,255,255,255,255,255,255,255,255
FAKH 1770 DATA 255,255,255,255,046,046,046,032,032,032,032,032,243,255
JCKI 1777 DATA 224,233,226,249,247,248,228,235,243,237,129,137,136,136
JBGM 1784 DATA 242,233,159,250,158,252,158,242,226,255,231,254,144,246
BOHM 1791 DATA 226,255,253,144,227,228,241,226,243,248,249,224,148,244
CFIC 1798 DATA 245,230,245,252,255,224,253,245,254,228,147,254,245,228
NOMK 1805 DATA 231,255,226,251,010,010,227,224,245,243,249,241,252,236
HPKN 1812 DATA 228,248,241,254,251,227,240,228,255,150,253,244,253,143
DFFF 1819 DATA 154,145,177,176,177,176,177,144,177,160,253,079,079,079
OIFC 1826 DATA 079,079,079,079,079,079,079,079,079,079,079,203,169,004
EBPC 1833 DATA 162,004,160,255,032,186,255,169,000,032,189,255,032,192
ONGF 1840 DATA 255,162,004,032,201,255,169,015,032,210,255,169,008,032
FNIG 1847 DATA 210,255,096
S-ENTRY CODE = EOOK
```

Converter

De Mulden Miquel C64

This program allows for the conversion of machine code to data statements, with the added bonus that the converter program will erase itself once the work is done! It can also be used to make spite binary data's "CHARGEN", more readily enjoyable than Basic. Note: the numbering will be continued in the correct order. (from 100 to 890).

```
ONOE 100 PRINTCHR$(147):POKE53280,0:POKE53281,0:POKE646,15
PBAA 110 PRINT"[CD2]* CONVERTER MACHINE CODE INTO BASIC"
LCHH 120 PRINT"[SP2]'DATA'-LINES ..."
HMIJ 130 PRINTSPC(25)"MDM, 17/9/88"
```

cont. on next page

```
KBOP 140 PRINT"[CD2]"
HLOM 150 INPUT"- START AT THE LOCATION[SP4]----[CL6]";AD$(1)
DPBI 160 INPUT"[CD]- FINISH AT THE LOCATION[SP3]----[CL6]";AD$(2)
AACK 170 REM * VERIFY OF INPUT'S *
JCDI 180 FOR I=1TO2
DHFM 190 IF LEN(AD$(I))<>4 THENRUN
HFIF 200 FOR J=1TO4
LGEO 210 IF VAL(MID$(AD$(I),J,1))<>0THEN270
BDPO 220 IF MID$(AD$(I),J,1)="0"THEN270
GGMP 230 :FOR K=65TO70
DPOJ 240 :IF MID$(AD$(I),J,1)=CHR$(K)THEN270
NFJF 250 :NEXT K
OLNP 260 :RUN:NEXTJ
NJMG 270 NEXTI
EOLJ 280 REM * CONVERSION OF THE LOCATIONS *
HABN 290 FOR I=1TO2
GDGL 300 FOR J=1TO4
EHOK 310 :A$=MID$(AD$(I),J,1)
LNFF 320 :IF VAL(A$)<>0 OR A$="0" THEN X=VAL(A$):GOTO340
PGAM 330 :X=ASC(A$)-55
PLGF 340 :AD=AD+(X*(16*4096/(16↑J)))
NCPM 350 NEXTJ:AD(I)=AD:AD=0
NOMC 360 NEXT I
ABHJ 370 IFAD(1)>AD(2) THENRUN
PGGE 380 REM * CREATION OF DATA-LINES *
EJIF 390 PRINT"[CLR]"
NBIO 400 LI=1000:AD=AD(1):AF=AD(2):POKE828,0
MOID 410 POKE646,15:PRINT"[CD23]"SPC(9)"[REV]ONE MOMENT, PLEASE
     [SP2]![ROF][HOM][CD2]"
NDLK 420 POKE646,0
GOHM 430 FOR I=1TO9:PRINTLI;"D♠";
LNIB 440 FOR J=1TO18
OJFI 450 A$=STR$(PEEK(AD)):A$=MID$(A$,2,LEN(A$))
NKAP 460 PRINTA$;",";
IDHH 470 IF AD=AF THEN PRINTCHR$(20):POKE828,1:GOTO540
PEIL 480 AD=AD+1
OGBG 490 NEXT J:PRINTCHR$(20):LI=LI+10
MMNI 500 NEXT I
DCOH 510 GOTO 530
FLBK 520 PRINT"[CLR]":GOTO410
OBNP 530 REM * SIMULATION DIRECT MODE *
JOGE 540 POKE820,INT(AD/256):POKE821,AD-(INT(AD/256)*256)
EHEI 550 POKE822,INT(AF/256):POKE823,AF-(INT(AF/256)*256)
KMLP 560 POKE824,INT(LI/256):POKE825,LI-(INT(LI/256)*256)
LFCH 570 POKE826,INT(AD(1)/256):POKE827,AD(1)-(INT(AD(1)/256)*256)
HNCA 580 FOR I=631TO640:POKEI,13:NEXTI
OMDE 590 POKE198,10
BHFF 600 PRINT"GOTO610":PRINT"[HOM]":END
OOKJ 610 AD=PEEK(820)*256+PEEK(821)
MDIK 620 AF=PEEK(822)*256+PEEK(823)
AMPD 630 LI=PEEK(824)*256+PEEK(825)
BNBC 640 AD(1)=PEEK(826)*256+PEEK(827)
HLEQ 650 PRINT"[CLR]":POKE646,0
DDPP 660 IF PEEK(828)=0THEN 410
OAKI 670 PRINT"[CLR][CD2]"
MFBJ 680 PRINT"10 FOR I=";AD(1);"TO";AF
JDJC 690 PRINT"20 READ D:POKE I,D"
NJDD 700 PRINT"30 NEXT I"
BEGM 710 PRINT"GOTO 800"
```

```
EODI 720 FOR I=631TO634:POKE I,13:NEXT I:POKE198,4
ILIC 730 PRINT"[HOM]":END
BMNO 790 REM * ERASE PROGRAM *
GOBM 800 I=0
CMOP 810 I=I+90:PRINT"[CLR][CD2]":POKE646,15
EBGB 820 FOR J= 0 TO 80 STEP10
OODD 830 :PRINT I+J:NEXT J
ECAI 840 IFI<810THENPRINT"GOTO 890"
POCF 850 IFI=810THENPRINT"LIST"
BDLB 860 POKE820,INT(I/256):POKE821,I-(INT(I/256)*256)
HHAI 870 FOR K=631TO640:POKE K,13:NEXT K
KJHF 880 POKE198,10:PRINT"[HOM]":END
KBPC 890 I=PEEK(820)*256+PEEK(821):GOTO810
S-ENTRY CODE - ACAC
```

★ Program Submission Procedure ★

DO NOT submit any program or routine that you do not either own or have authority to do so.

ALWAYS include your name, address and date on all material sent.

NEVER use staples, use paperclips if necessary.

If you are using TAPE save the program at least TWICE on each side. DO NOT USE TURBO SAVE SYSTEMS.

If you are using DISK save the program at least twice and call the second program BACKUP.

IDENTIFY your tape/disk with: your name and address, the program name and WHAT COMPUTER it is for.

PLEASE do not submit hand-written work, unless it is unavoidable. *** Note *** you can always write your instructions in the form of a computer program, eg 1 PRINT 'your text' etc.

INCLUDE a short statement of what your program is supposed to do.

IF YOU USE A WORDPROCESSOR supply a standard ASCII file of the article, this allows us to load it into our standard wordprocessors.

INCLUDE the following STANDARD header on all programs. Even if your program is in multiple parts, include this information on each part
(this will be stripped off prior to publication).

NAME ....
ADDRESS
ADDRESS
ADDRESS
POSTCODE
COUNTRY
TELEPHONE No. (if poss).
COMPUTER
DOS/ROM TYPE
PROGRAM NAME

ALWAYS ensure that disks are well packed, Use a commercial disk mailer or at least packed between two pieces of thick cardboard or rigid plastic.

MARK the package MAGNETIC MEDIA DO NOT BEND OR EXPOSE TO MAGNETIC FIELDS in BOLD letters on BOTH sides.

Please allow at least 8 weeks for acknowledgement as all programs have to be thoroughly tested and put into a suitable format.

Enclose a self-addressed stamped envelope or package if you would like your program to be returned.

Overseas submissions can use IRC's International Reply Coupons.

* Programming Tips *

If you can, use CHR$(x) type commands instead of graphic characters.

Renumber your program in a standard form, most readers use auto number utilities to ease typing in.

Try to keep instructions within the program fairly short. You can expand on them within the text if necessary

TEST YOUR PROGRAMS..better still get a friend to test them for you.

IF YOUR PROGRAM CONTAINS MACHINE CODE:
Please use DECIMAL data statements, NOT HEX for the BASIC loader. Keep the same number of data statements on each line (MAX 14) and use the three digit format if possible. eg 000,010,243,001 etc.

continued on page 94

Rebound

The program rebound was printed in CCI June. Tape users will need a loader to run the program. Here it is and our apologies for any inconvenience this may have caused.

```
MKJG 0 REM LISTING ONE FOR TAPE
INAK 10 A=A+1:IF A<>1 THEN SYS 49152
EEPD 20 POKE 53280,11:POKE 53281,11
GHBN 30 PRINT CHR$(147)+CHR$(5)
GNNM 40 LOAD "CODE",1,1
S-ENTRY CODE = OLMM
```

S-ENTRY

```
100 REM
110 REM*******************************
120 REM*                             *
130 REM*         CCI S-ENTRY         *
140 REM*                             *
150 REM*       FOR THE C64 & C128    *
160 REM*                             *
170 REM*(C)1989,A.ESKELSON & G.CATTLEY*
180 REM*                             *
190 REM*******************************
200 REM
210 M1=256*PEEK(179)+PEEK(178):C8=65281:C9=C8-2:FA=250:FB=251:FC=252
220 POKE C8,00:REM IF 128 SET BANK 0
230 MC=M1+9:CC=0:FOR I=0 TO 61:READ ZZ
240 CC=CC+ZZ:POKE M1+I,ZZ:NEXT I
250 REM DATA FOR CRC
260 DATA 169,000,133,250,133,251,133,252,096,169,000,133,252,162,008,165
270 DATA 250,042,038,253,042,042,042,042,042,069,253,133,253,165,250,069
280 DATA 253,133,253,165,251,042,042,042,069,253,133,253,038,252,042,069
290 DATA 253,106,038,251,038,250,202,208,214,166,251,165,250,096
300 IF CC<>9069 THEN PRINT"ERROR IN CHECKSUM DATA":STOP
310 REM
320 REM TEST FOR C128/C64
330 IF M1=2816 THEN C64=2:SA=3072:GOTO 360
340 IF M1=828 THEN C64=1:SA=49152:GOTO 360
350 PRINT"ERROR NOT C64 OR C128 ?":STOP
360 READ TC:EQ=0:EA=SA:SYS M1
370 HB=INT(SA/256):LB=0
380 REM START OF LOOP
390 READ DA$:REM READ THE DATA
400 IF DA$="-9999" THEN 480:REM FINISHED ALL THE DATA
410 DA=VAL(DA$):PRINTSA;CHR$(145)
420 IF LEN(DA$)<>3 THEN 450
430 POKE SA,DA:SA=SA+1
440 POKE MC+1,DA:SYS MC:GOTO 390
450 A%=PEEK(FA):X%=PEEK(FB):CK=A%*256+X%
460 IF CK<>VAL(DA$) THEN EQ=1:GOTO 480
470 GOTO 390
480 IF EQ OR (CK<>TC) THEN 510
490 POKE FA,LB:POKE FB,HB:POKE FC,C64:SYS EA
500 PRINTCHR$(147);"S-ENTRY ACTIVE. TYPE '@NEW' TO CLEAR LOADER":END
510 PRINT"LINE/DATA ERROR IN LINE";
520 PRINT PEEK(66)*256+PEEK(65):END
530 DATA 44232
540 DATA 024,165,250,105,028,133,176,165,251,105,002,133,177,169,000,170,48900
550 DATA 168,024,177,176,133,254,200,177,176,101,251,133,255,200,177,176,00903
560 DATA 201,255,240,008,024,101,251,129,254,200,208,229,024,165,250,105,18744
570 DATA 112,133,176,165,251,105,002,133,177,024,165,250,105,126,133,254,17887
580 DATA 165,251,105,000,133,255,162,000,164,252,177,176,072,161,176,240,44466
```

```
590 DATA 017,168,104,145,254,165,176,024,105,003,133,176,144,002,230,177,32098
600 DATA 208,230,104,169,000,141,005,003,169,126,141,004,003,169,000,133,49661
610 DATA 252,173,038,003,141,152,062,173,039,003,141,153,002,096,160,000,49456
620 DATA 132,251,132,250,132,180,132,254,132,253,185,000,002,201,032,208,52892
630 DATA 003,200,208,246,201,095,208,017,072,169,171,141,038,003,169,002,22812
640 DATA 141,039,003,032,154,002,104,208,053,072,173,152,002,141,038,003,55274
650 DATA 173,153,002,141,039,003,104,201,064,240,035,201,033,240,013,201,41233
660 DATA 038,208,033,076,068,001,173,141,002,208,251,096,169,067,141,005,20351
670 DATA 003,169,013,141,004,003,169,000,153,000,002,076,013,067,032,128,63881
 80 DATA 003,024,144,247,165,252,240,007,169,000,133,252,024,144,236,132,15406
 90 DATA 252,152,024,105,004,168,185,000,002,240,007,032,211,001,200,208,05629
 00 DATA 245,000,164,252,162,001,185,000,002,072,169,032,153,000,002,104,21893
 10 DATA 056,233,065,024,010,010,010,010,133,252,200,185,000,002,072,169,54075
 20 DATA 032,153,000,002,104,056,233,065,041,015,005,252,213,250,208,011,11281
 30 DATA 200,202,016,210,169,255,133,252,076,209,077,169,000,133,252,162,54224
 40 DATA 022,108,000,003,162,001,181,045,149,176,202,016,249,141,001,255,56924
 50 DATA 160,000,132,251,132,250,132,180,132,254,132,253,160,001,177,176,45691
 60 DATA 240,040,200,177,176,032,211,001,200,177,176,032,211,001,200,177,58968
 70 DATA 176,240,007,032,211,001,200,016,246,000,160,000,132,254,177,176,22791
 80 DATA 170,200,177,176,134,176,133,177,208,210,160,000,140,000,255,185,63767
 90 DATA 154,001,240,022,032,210,255,200,208,245,083,045,069,078,084,082,26008
 00 DATA 089,032,067,079,068,069,032,061,032,000,162,001,181,250,072,041,42873
 10 DATA 240,074,074,074,074,024,105,065,032,210,255,104,041,015,024,105,62214
 20 DATA 065,032,210,255,202,016,229,141,003,255,169,000,141,000,002,076,51028
 30 DATA 222,000,096,201,034,208,008,072,165,254,073,255,133,254,104,201,08627
 40 DATA 032,208,004,036,254,016,052,133,180,169,001,072,165,251,041,128,08832
 50 DATA 042,038,253,165,251,041,008,106,106,106,069,253,133,253,165,251,26391
 60 DATA 069,253,133,253,165,250,042,042,042,069,253,133,253,038,180,042,59214
 70 DATA 069,253,106,038,250,038,251,104,010,144,208,096,100,000,000,197,16654
 80 DATA 000,001,253,000,001,103,001,001,109,001,001,117,001,001,145,001,10659
 90 DATA 001,209,001,000,118,000,002,124,000,002,159,000,002,165,000,002,52822
 00 DATA 172,000,002,178,000,002,211,002,002,001,003,002,010,003,002,019,14849
 10 DATA 003,002,035,003,002,050,003,002,028,003,002,231,002,002,222,002,52909
 20 DATA 001,047,003,002,194,002,002,200,002,002,042,003,000,255,255,255,04528
 30 DATA 079,165,067,084,124,013,094,124,013,095,165,067,201,043,045,097,06351
 40 DATA 115,128,098,000,003,187,138,209,188,164,077,073,141,211,074,002,22835
 50 DATA 000,000,064,064,064,064,064,032,000,000,160,000,132,251,132,250,37171
 60 DATA 132,180,132,254,132,253,132,177,132,176,096,134,182,132,181,201,46369
 70 DATA 013,240,054,166,177,208,037,201,058,176,038,201,046,208,016,072,22106
 80 DATA 173,152,002,141,038,003,173,153,002,141,039,003,104,208,018,164,50064
 90 DATA 176,153,146,002,230,176,201,032,208,002,230,177,032,211,001,169,15787
000 DATA 001,166,182,164,181,108,152,002,096,164,177,240,244,169,002,072,30286
010 DATA 168,136,185,250,000,072,041,240,074,074,074,074,024,105,065,032,48296
020 DATA 225,002,104,041,015,024,105,065,032,225,002,104,074,144,224,169,27482
030 DATA 061,032,225,002,169,000,133,176,164,176,185,146,002,201,032,240,17276
040 DATA 007,032,225,002,230,176,016,240,032,198,000,169,013,032,154,002,25087
050 DATA 076,225,002,255,44232,-9999
```

C64/128

BASIC COMMANDS

S-ENTRY intercepts several vectors in the operating system, and because of this the normal basic commands are not available.... don't worry... you can still use them by prefixing the command with the @ symbol, so SAVE would become @SAVE etc.

NOTE do not use any DOS wedge, or you will confuse S-ENTRY.

S—ENTRY DISABLE

Before you run any programs that you have entered, S-ENTRY MUST BE DISABLED. Enter an ! on its own and S-ENTRY will be removed from memory and the normal operating system restored. REMEMBER ALWAYS SAVE A PROGRAM BEFORE YOU RUN IT!

MISSING LINES

In order to provide you with a flexible system, S-ENTRY only checks on a line by line basis. So if you miss out line 540 say, S-ENTRY will NOT report an error.

This may sound odd, but it does allow you to enter part of the program, then save it and come back to it at a later date. This is also helpful if you and several friends are splitting up the job of entering a large program, each person will be able to say that what has been entered is correct.

To make sure that you have the entire program, entered correctly Enter type '&' symbol on its own. S-ENTRY will then calculate the S-ENTRY code for the program in memory, you can compare this with the Final S-ENTRY code printed at the end of the listing.

ADVANCED USE

If you think that you are good enough not to use the S-ENTRY system, you can simply enter the normal basic lines after the S-ENTRY code. But what if you get it wrong? Well S-ENTRY has a command that will produce a summary of the S-ENTRY code and the line number in memory, you can then compare this with the published S-ENTRY codes and thus track down the problem. This command is ←LIST you can pause the list by using the Shift/Shift Lock keys. The command will also accept a line number range, ie 100-200 or 200— etc.

The ONLY difference that S-ENTRY makes to the published listing is the addition of the four character code before the line number, and the addition of the Final S-ENTRY code at the end of the listing.

S—ENTRY COMMAND SUMMARY

&	Calculates the S-ENTRY code for the entire program in memory.
@	Prefix to a basic command ie @DSAVE or @LOAD
!	Remove S-ENTRY
←LIST	Display S-Entry code summary, use shift/shift lock to pause.

YOU MUST

1. Use EXACTLY the same line numbers.
2. Enter the program exactly as printed, including all REMs.
3. Use EXACTLY the same commands, FULL command names MUST be used, ie '?' cannot be used instead of PRINT.
4. Remember to convert the easy enter codes ie [SP9] means type 9 spaces.
5. Type anything between " " (quotes) EXACTLY as published.

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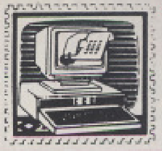

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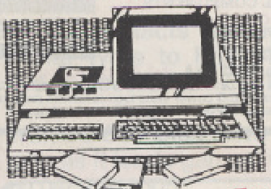

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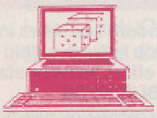

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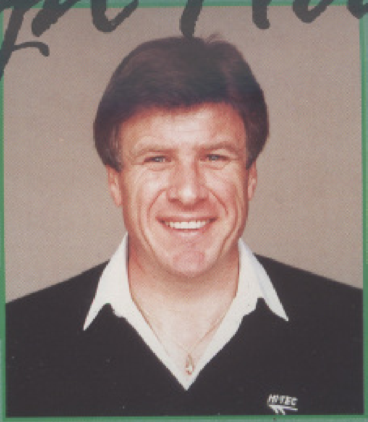

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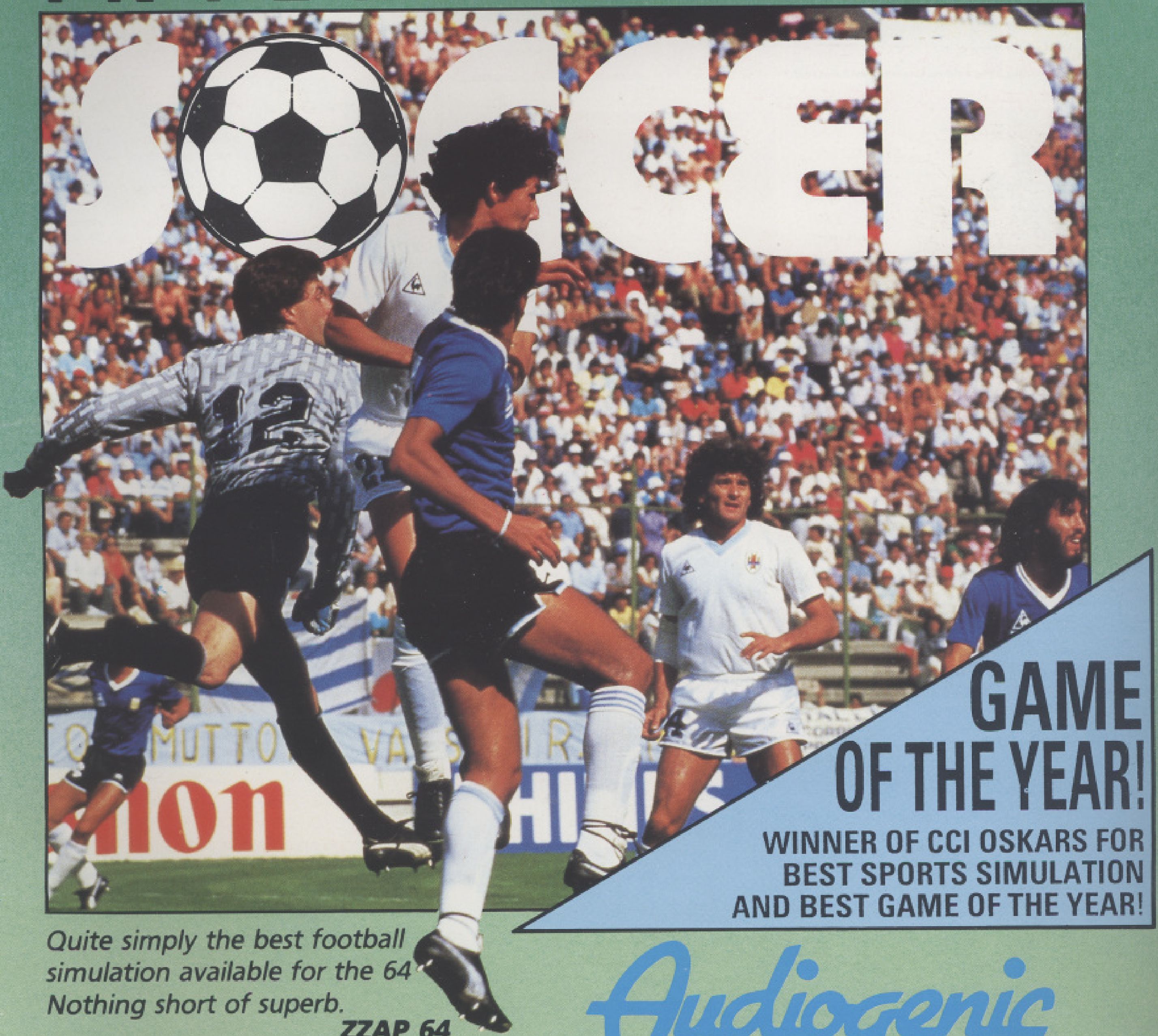

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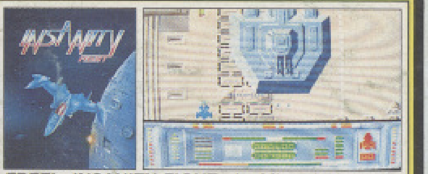

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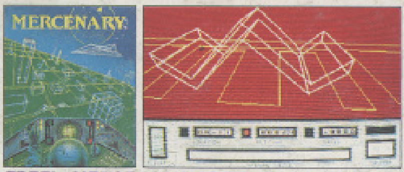

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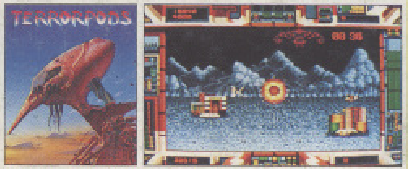

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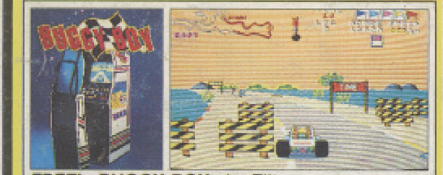

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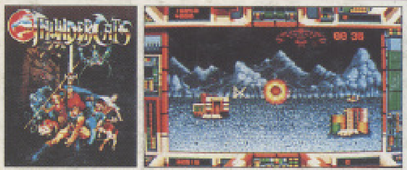

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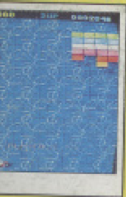

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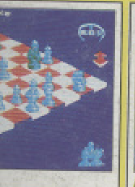

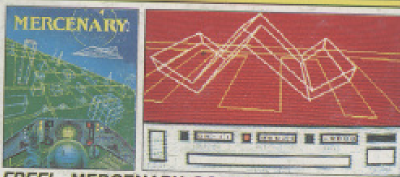
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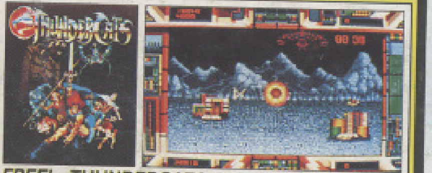
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